Noah Steuri

Evolution of burial practices within Neolithic cist graves

Tracking funerary customs in the Western Alpine region (4800–3800 BCE)

6

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Tracking funerary customs in the Western Alpine region (4800–3800 BCE)

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Foreword

Albert Hafner, Marie Besse

In 1919, historian Otto Tschumi (1878-1960) completed his habilitation at the University of Bern with a study titled "The Stone Age Burials in Crouched Positions of Switzerland." 100 years ago Tschumi was appointed as Associate Professor of Prehistory and Early History at the University of Bern, marking the establishment of the first professorship in archaeology at the institution. Since Tschumi's initial compilation, Neolithic graves of the Chamblandes-type have been extensively studied, not only in Switzerland but also in the neighboring Alpine regions of Italy and France.

The discovery of stone cists burials with skeletons in crouched position began as early as 1826 and 1835 in the municipality of Pully, specifically in the Pierraz-Portay area. Additional significant finds emerged in Châtelard quarter of Lutry in 1835. Pully and Lutry are communities located to the west of the city of Lausanne, nestled along the northern shore of Lake Geneva. However, the most notable discovery occurred in 1901 in the Chamblandes area of Pully. Albert Naef (1862-1936), who led the Vaud Monuments Department from 1899 to 1934 and was Switzerland's first cantonal archaeologist, conducted these excavations. Naef's meticulous documentation, using both camera and pencil, remains impressively detailed and aesthetically remarkable, ahead of its time. His discoveries gave their name to the burials with inhumations in crouched position found in stone cists, which became increasingly prevalent around Lake Geneva and in the Rhône Valley throughout the early 20th century.

Noah Steuri's dissertation represents the first comprehensive study of the stone cist graves in the western Alpine region in nearly a century. It offers an exemplary summary of current knowledge and clarifies the chronology of these graves through numerous radiocarbon dates. This study is a significant advancement, opening up previously underexplored areas such as the southern Alpine Aosta Valley and highlighting the Chamblandes phenomenon as a transalpine occurrence. It demonstrates that the Alps, far from being a barrier, were a conduit for social exchange and interaction across valleys and passes in early history. Steuri's work thus provides a crucial contribution to understanding the early development of agrarian communities in the western Alpine region.

With the advent of radiocarbon dating and paleogenetic methods, inhumations have become a captivating subject in interdisciplinary prehistoric archaeology. We anticipate that this publication will attract significant interest and wish Noah Steuri continued success in his scientific endeavors. Our gratitude extends to the archaeological agencies and museums in Switzerland, Italy, and France for their support in providing finds and documentation, and to the Swiss National Science Foundation for its generous funding.

PART I
OUTLINE

1 Introduction

This chapter introduces this study with opening remarks (Chapter 1.1) and the research aims (Chapter 1.2).

1.1. Opening remarks

Over the last 200 years, hundreds of Neolithic cist graves have been discovered in the Western Alpine region of present-day Switzerland, France, and Italy. These graves were in use for a surprisingly long period of about 1000 years, dated between 4800 and 3800 BCE.

All of these cist graves are of the Chamblandes-type, named after the eponymous site of Pully, Chamblandes (Vaud, Switzerland). Traditionally, the study of Chamblandes-type graves has been constrained to the Swiss areas of the northern shore of Lake Geneva and the Upper Rhône Valley. Even though all of these regions are connected by Alpine passes, only a few analyses have covered Neolithic cist graves found in the adjacent French and Italian Alpine valleys. These Alpine passes usually have altitudes of over 2000 m above sea level. Therefore, together with the recent finds from the Schnidejoch mountain pass (Chapter 2.2.2; Hafner, 2015), this grave type reveals that the Alpine region was widely populated and witnessed complex social exchange networks well before the Copper Age, which is best known for Ötzi the Iceman, the famous mummy dating to around 3200 BCE (Kutschera and Rom, 2000).

The distribution of the cist grave sites shows that they are situated on both sides of the Alpine ridge. This illustrates that Alpine valleys should not be regarded as frictional landscapes during early prehistoric periods, but instead as connected and well-frequented regions. Moreover, this highlights the broader intraregional significance of this burial type within the Alpine region. Situated in the border areas of larger Neolithic cultural zones in Eastern France, Northern Italy, and Southern Germany, Chamblandes-type graves are an ideal focus point for the study of transalpine Neolithic exchange networks.

Neolithic graves of the Chamblandes-type usually consist of lateral stone slabs or wooden planks forming a rectangular box or cist of varying small dimensions. These could contain one single burial or the remains of collective burials of up to 17 individuals. Primary burials were generally placed on the left side of the body with the lower limbs flexed. In addition, a range of secondary burial elements are recognisable, such as the displacement of human remains or cremations. Chamblandes graves typically include few grave goods, which has made their chronological and cultural historical interpretation difficult. Accordingly, serial radiocarbon dating becomes essential, not only for a chronological reconstruction of the contexts but also for a better understanding of the complex social networks characterising both sides of the Alps during the periods of early farming societies.

This study aims to track the evolution of funerary customs within Chamblandes-type graves between 4800 and 3800 BCE. These graves and their contents are the results of in-

tentional and structured actions, conceptualised as rituals. Recurring patterns of rituals within a certain geographical area are regarded as a custom of the local, prehistoric society during a certain period. In that sense, necropolises with up to hundreds of Chamblandes-type graves and rather standardised burial rituals show that the community decided to bury their deceased in a particular, delimited area and custom. Moreover, in the context of this study, successful collaborations between regional archaeological authorities, museums, and universities from Switzerland, France, and Italy make it possible to overcome the lack of radiocarbon data in key sites of the Alpine regions. Almost 20 years after the Lausanne colloquium of May 2006, which extensively covered some aspects of Chamblandes-type graves and their place within Western European Neolithic burial practices (Moinat and Chambon, 2007), this study aims to summarise and expand on the current state of research on this topic.

1.2. Research aims

The main goal of this study is to assess the evolution of burial practices and track funerary customs of the first farming societies in the Western Alpine region during the 5th millennium BCE. During this period, the remains of the deceased were generally placed within so-called Chamblandes-type cist graves. Previous attempts to characterise this grave type neglect certain key elements (e.g. the treatment of the human remains or related burial practices). Therefore, an initial aim is to present a comprehensive definition of Chamblandes-type graves, incorporating not just architectural features, but also the corresponding treatment of human remains. To this end, a preliminary goal of this study was set on addressing and filling existing research gaps regarding certain sites or entire regions (e.g. regarding previous research biases and the research history of this grave type in general). This can only be achieved with a consistent listing of all available data of sites throughout the research area. For the first time, the intraregional aspects of Western Alpine Neolithic cist graves in today's Switzerland, France, and Italy are examined, allowing for a comprehensive discussion of Chamblandes-type graves in their broader geographical and cultural context. The compiled and generated data will provide a basis to discuss additional aspects, such as potential differentiations based on sex or age classes in burial rituals or the emergence of megalithic elements in the study area to draw conclusions on the social organisation and gender expression of these first farming societies in the research area.

To reach the overarching research objective of this study, three major approaches are taken:

- Tracking the origin and spread of burial practices within Chamblandes-type graves. This requires large-scale radiocarbon dating of bone samples. As the available radiocarbon data are regarded as insufficient, a larger series of human bone samples from sites throughout the research area needs to be extracted and analysed. The combined evaluation of the radiocarbon data will allow us to assess the research questions of where and when cist burials originally emerged, and over which axis this grave architecture together with the related burial practices spread.
- Assessing the archaeological materialisation of various burial practices recognisable within Western Alpine Neolithic cist graves. This consists of evaluating aspects regarding the treatment of human remains, as well as the spatial organisation of sites. The consideration of these aspects in combination with the radiocarbon data allows us to discuss the evolution of burial practices in the study area. Additionally, recurring patterns will provide a basis to identify and track certain funerary customs.

- Assessing the general characteristics and frequency of certain types of archaeological objects within Neolithic cist graves. One objective is to detect possible exchange networks by conducting a typological comparison of specific grave goods and to evaluate the likely origin of the raw material for selected types of objects. In addition, grave goods will be contextualised with recognisable burial practices in order to assess possible social meanings and functions of these objects within the burial context. Combining these results with the series of new radiocarbon data, a further goal of this study was to analyse the regionality and chronology of specific types of grave goods.

2 Background

Regarding the research aims (Chapter 1.2), it is essential to first cover the background and context of Western Alpine Neolithic cist graves. Therefore, the first subchapter (Chapter 2.1) will focus on assessing the characteristics and research history of this grave type. Next, various aspects of its archaeological context in the Western Alpine region are outlined (Chapter 2.2). Finally, some concepts of burial archaeology relevant to this study are covered (Chapter 2.3).

2.1. Research of Western Alpine Neolithic cist graves

First, the characteristics of the discussed cist graves are specified in a subchapter (Chapter 2.1.1). Then, the history (Chapter 2.1.2) and state of research (Chapter 2.1.3) of this grave type in the studied region are covered. For specific sites, these aspects are listed in detail in Chapter 4.

2.1.1. Defining Chamblandes-type graves

In the literature, Neolithic cist graves in the Western Alps are referred to as Chamblandes-type graves, named after a site on the northern shore of Lake Geneva (see Chapter 4.5.2). Previous definitions of this grave type (Gallay, 2007, 340–341) did not focus on particular key elements. With that in mind, Neolithic cist graves in the Western Alpine region can be characterised by the following features:

- They are generally constructed in pits,
- They consist of at least four fitted lateral stone slabs or wooden planks with a horizontal cover of one or multiple stone slabs (capstones) or wooden planks,
- They are formed as rectangular boxes of varying small dimensions so that a stretched placement of an adult individual is not possible,
- They can be accessed only horizontally,
- The burials have the same general orientation within sites,
- There is a high density of graves within sites.

These criteria unite the common denominators of architectural features shared between cist graves. The bodies of the deceased were generally placed on the left side, with the legs contracted to varying degrees and the head mostly towards the east/northeast. The treatment of the human remains within these graves, however, exhibits great variability, which will be covered extensively in this study. Moreover, multiple and/or collective burials using these cist graves were previously considered a secondary phenomenon (Gallay, 2007, 340–341). However, with varying frequencies, multiple usage phases of cist graves are detectable within almost all sites. Therefore, these aspects in combination with a range of secondary burial practices, such as the deposition or displacement of human remains, need to be considered regarding all characteristics of Neolithic cist graves in the Western Alpine region.

As capstones are frequently missing, the question arose if most, or at least some horizontal, covers of stone cists were made of organic material such as wood. This is rather unlikely, since the construction of stone cists would have required a lot of manpower and technical know-how, specifically concerning the transport and processing of the slabs. A "compromise" regarding the cover due to technical difficulties or a lack of raw materials is rather unlikely, especially considering that the fitted lateral slabs were mostly invisible due to the subsurface grave construction. A more likely scenario is that the capstones were removed, displaced, and/or damaged in modern times due to agricultural activities. As capstones could weigh up to one tonne, it was suggested that collective graves could initially have been covered by lighter material during their time of use, and only afterwards was a massive capstone placed (Baudais et al., 2017, 87–88).

2.1.2. History of research

Over the last nearly 200 years, hundreds of prehistoric stone cist graves have been discovered in the Western Alpine region relevant to this study in present-day Switzerland, France, and Italy (Fig. 1). However, the study of Chamblandes-type graves has traditionally been centred on the Swiss areas of the northern shore of Lake Geneva and the Upper Rhône Valley.

Not without reason is this grave type named after the necropolis of Pully, Chamblandes (Vaud, Switzerland). The site is located on the northern shore of Lake Geneva. It has been known since the 1880s and gained notoriety due to the excavations conducted between 1901 and 1910 under Albert Naef and Alexandre Schenk, during which stone cist graves were extensively documented by photographs and drawings (Fig. 2; Naef, 1901). The site could have consisted of up to 300 graves, however, a comprehensive assessment of the necropolis remains difficult due to the different campaigns and researchers between the 19th century and 1992 (Moinat, 2007).

In 1962, a vast necropolis was discovered in Lausanne, Vidy (Vaud, Switzerland), and during the excavation campaign of 1989/90, around 100 graves were examined. A large percentage of these graves were wooden cists. So far, only some aspects or short reports of this necropolis have been published (Jungnickel, 2019; Moinat, 2007).

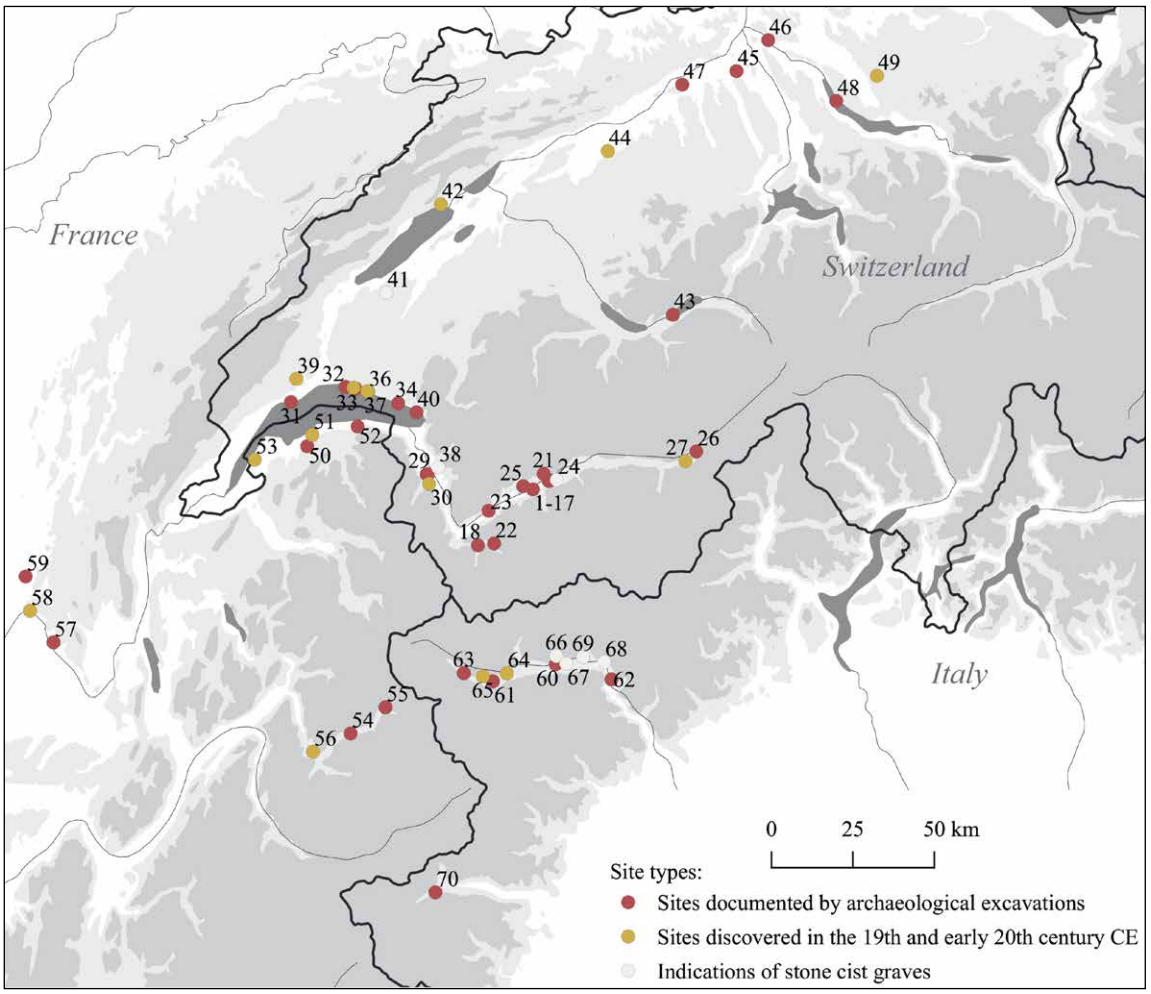
In 1965, at Corseaux-sur-Vevey (Vaud, Switzerland), stone cist graves were discovered, followed by a partial excavation of a necropolis in 1974. In contrast to the two previous sites, extensive research has been published on these graves (Baudais and Kramar, 1990).

In addition, the discoveries of multiple sites with stone cists have been reported in the canton of Vaud in the 19th or early 20th century CE, however, little information is available (Fig. 3).

In the Upper Rhône Valley, a clustering of at least 17 sites has been reported within the municipality of Sion (Valais, Switzerland) (Fig. 4). These consist of isolated burials and necropolises of up to 25 graves. Since the end of the 19th century CE, Chamblandes-type graves have been discovered and excavated; for example, during the 1980s, the sites of Sous-le-Scex (Honegger, 2011), Chemin-des-Collines, or Avenue Ritz (Moinat et al., 2007a), as well as more recently, in 2006, Place et Rue des Remparts (Mariéthoz, 2007a). Interestingly, they were all found within a radius of under 500 m from each other. In total, these sites contain over 100 stone cists and at least 15 wooden cists/pit graves and have been relatively well researched.

To the West of Sion, Chamblandes-type graves were found along the Rhône, reaching until Lake Geneva; an example is the two neighbouring necropolises I and II of Collombey-Muraz, Barmaz (Valais, Switzerland), where a new evaluation is currently ongoing (communication M. Honegger, 2021).

In contrast, only two sites of stone cist graves have been discovered in the eastern, German-speaking part of the Upper Rhône Valley. These consist of four graves documented in Bitsch (Valais, Switzerland) in 1951 and a few stone cists discovered at the end of the 19th century CE in Brig-Glis (Valais, Switzerland). The characteristic grave goods of



1-17	Sion, various sites (Valais, Switzerland)	44	Seeberg, Burgäschisee (Bern, Switzerland)
18	Sembrancher, Cretaz-Polet (Valais, Switzerland)	45	Lenzburg, Goffersberg (Aargau, Switzerland)
19	Saint-Léonard, Les-Bâtiments (Valais, Switzerland)	46	Wettingen, Schartenstrasse (Aargau, Switzerland)
20	Saint-Léonard, MTA (Grand Pré) (Valais, Switzerland)	47	Däniken, Studenweid (Solothurn, Switzerland)
21	Ayent, Zampon-Noale (Valais, Switzerland)	48	Erlenbach, Geren (Zurich, Switzerland)
22	Bagnes-Villette, Les Dzardis (Valais, Switzerland)	49	Pfäffikon, Speckholz (Zurich, Switzerland)
23	Saillon, Sous-les-Bercls (Valais, Switzerland)	50	Thonon-les-Bains, Genevray (Haute-Savoie, France)
24	Granges, Le Pentzet (Valais, Switzerland)	51	Thonon-les-Bains, Entre Rive et le Château de la Fléchère (Haute-Savoie, France)
25	Savièse, Château de La Soie (Valais, Switzerland)	52	Lugrin, Le-Petit-Tronc (Haute-Savoie, France)
26	Bitsch, Massaboden (Valais, Switzerland)	53	Chens-sur-Léman, Sur les Plans/ Douvaine, Les Plans (Haute-Savoie, France)
27	Brig-Glis, Schönbiel (Valais, Switzerland)	54	Aime, Le-Replat (Savoy, France)
28	Collombey-Muraz, Barmaz I (Valais, Switzerland)	55	Bourg-Saint-Maurice, Châtelard (Savoy, France)
29	Collombey-Muraz, Barmaz II (Valais, Switzerland)	56	Aigueblanche, Bellecombe (Savoy, France)
30	Monthey, Chenau (Valais, Switzerland)	57	Montagnieu, Grotte-du-Souhait (Isère, France)
31	Allaman, En-Verex (Vaud, Switzerland)	58	Port de Lagnieu, entre Lagnieu et Saint-Sorlin (Ain, France)
32	Lausanne, Vidy (Vaud, Switzerland)	59	Ambérieux-en-Bugey, Sous la Chaume (Ain, France)
33	Pully, Chamblandes (Vaud, Switzerland)	60	Quart, Vollein (Aosta, Italy)
34	Corseaux-sur-Vevey, En Seyton (Vaud, Switzerland)	61	Villeneuve, Champ Rotard (Aosta, Italy)
35	Lausanne, Pierra-Portay (Vaud, Switzerland)	62	Montjovet, Fiusey (Aosta, Italy)
36	Lutry, Montagny (Vaud, Switzerland)	63	La Salle, Derby (Aosta, Italy)
37	Lutry, Châtelard (Vaud, Switzerland)	64	Sarre (Aosta, Italy)
38	Saint-Triphon (Ollon), Le-Lessus (Vaud, Switzerland)	65	Saint-Nicolas (Aosta, Italy)
39	Yens, Bois de Sembres/les Sembres (Vaud, Switzerland)	66	Quart, Effraz (Aosta, Italy)
40	Montreux-Clarens, Fin-de-Tavel (Vaud, Switzerland)	67	Nus, Fognier (Aosta, Italy)
41	Chavannes-le-Chêne, Vallon-des-Vaux (Vaud, Switzerland)	68	Saint-Vincent (Aosta, Italy)
42	Saint-Blaise, Chemin-du-Diable (Vaud, Switzerland)	69	Saint-Denis, Ploi (Aosta, Italy)
43	Niederried, Ursisbalm (Bern, Switzerland)	70	Chiomonte, La Maddalena (Piedmont, Italy)

Figure 1: Map and chart indicating the location, name, and type of Chamblandes grave sites.

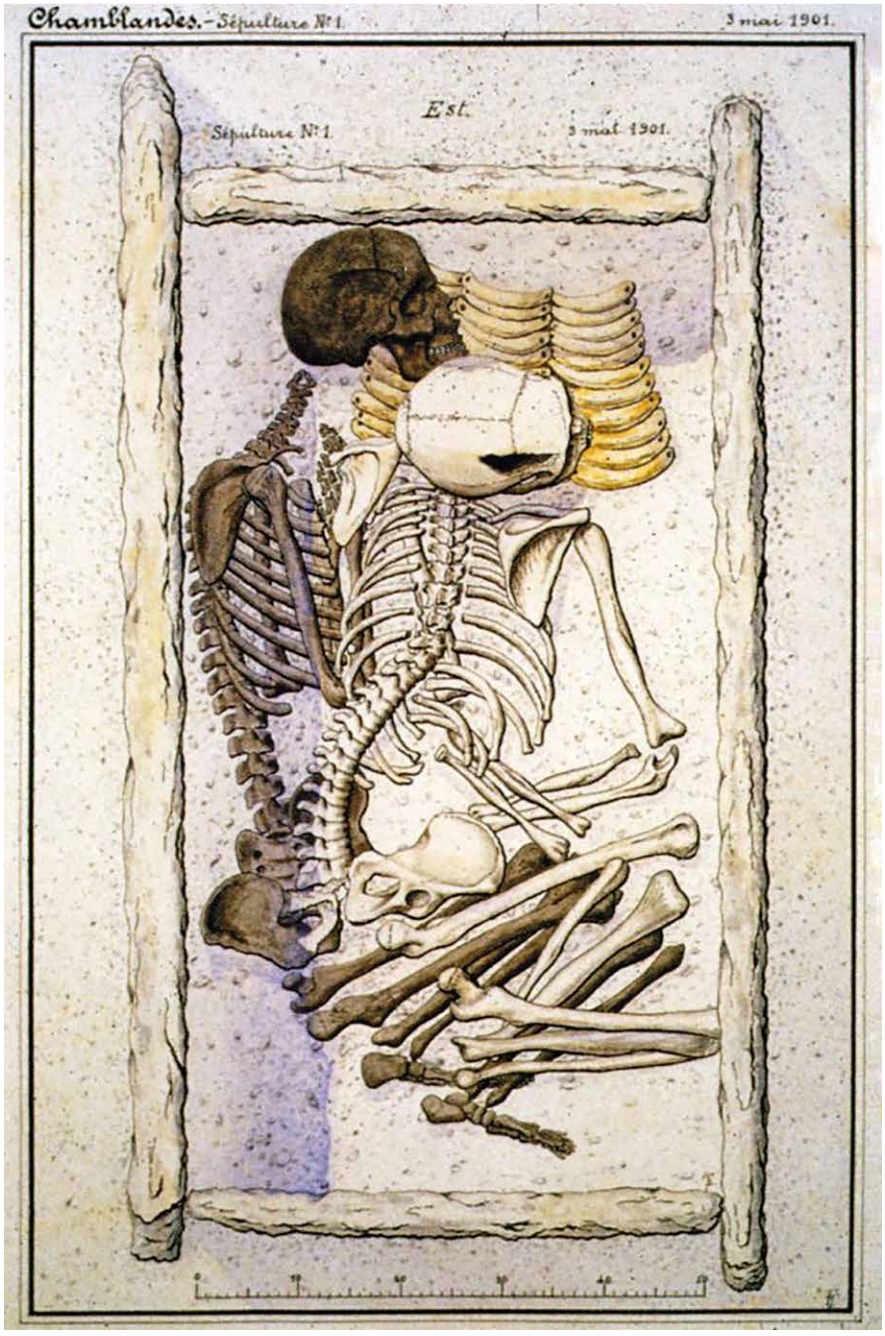


Figure 2: Drawing of grave T1 from the site of Pully, Chamblandes, by A. Naef on 03.05.1901 (source: © Gallay 2008).

the latter even gave names to specific types of objects (e.g. type Glis-Weissweil flint axes or type Glis buttons [Loretan, 2011, 32–35]).

Compared with sites in Western Switzerland, Chamblandes-type graves in neighbouring Italy were generally only briefly mentioned or indicated as dots on distribution maps (e.g. Beeching, 2007, 71). In his dissertation of 1977 and subsequent publications, Alain Gallay only lists five sites with presumed Chamblandes-type graves in the Aosta Valley (Gallay, 2008, 346–347, 1999, 69, 1977, 167), and in a recent article, Christian Jeunesse, Samuel van Willingen, and Anthony Denaire depict the same five sites on a map without providing further information (Jeunesse et al., 2019, 66). Similarly, the graves from the Aosta Valley are largely missing from the publication of the colloquium on the state of research on the Chamblandes-type, and only

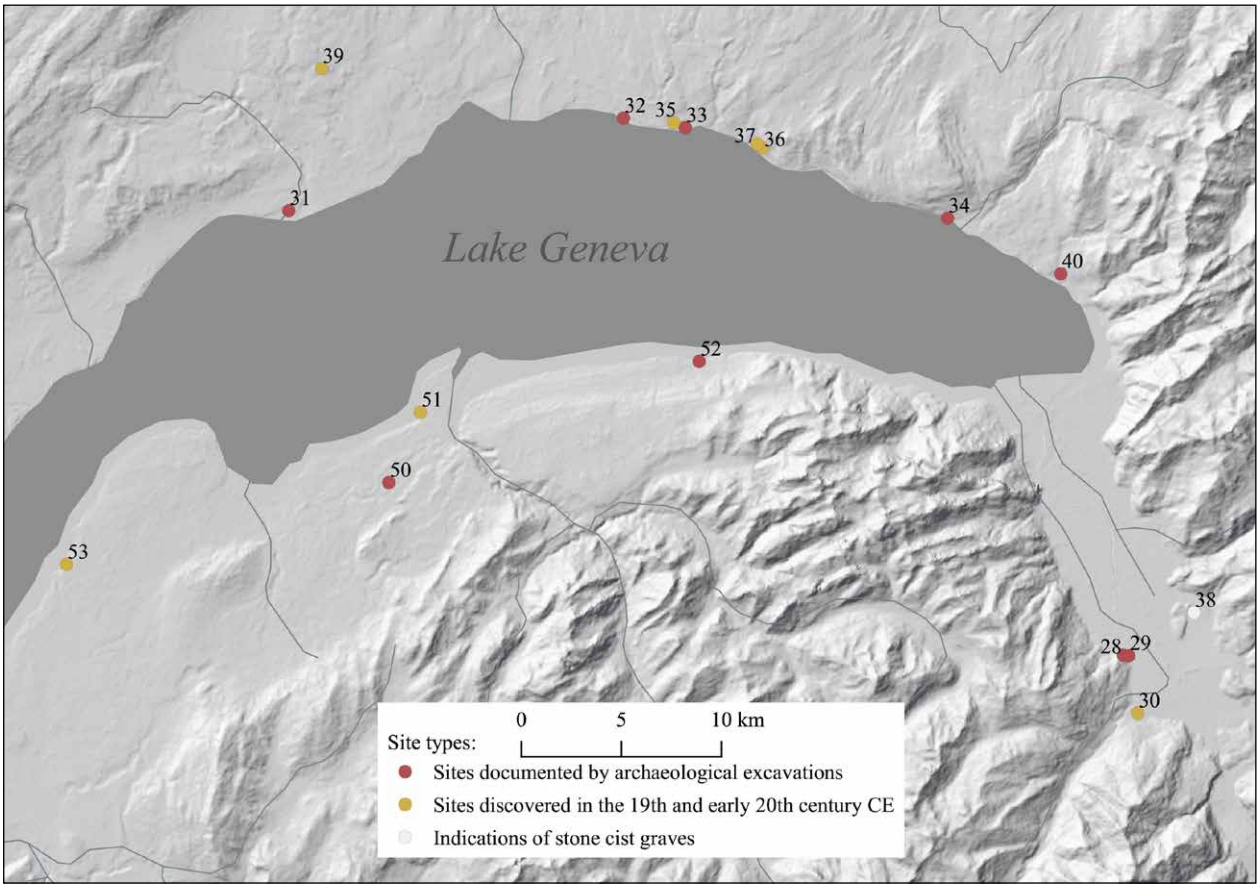


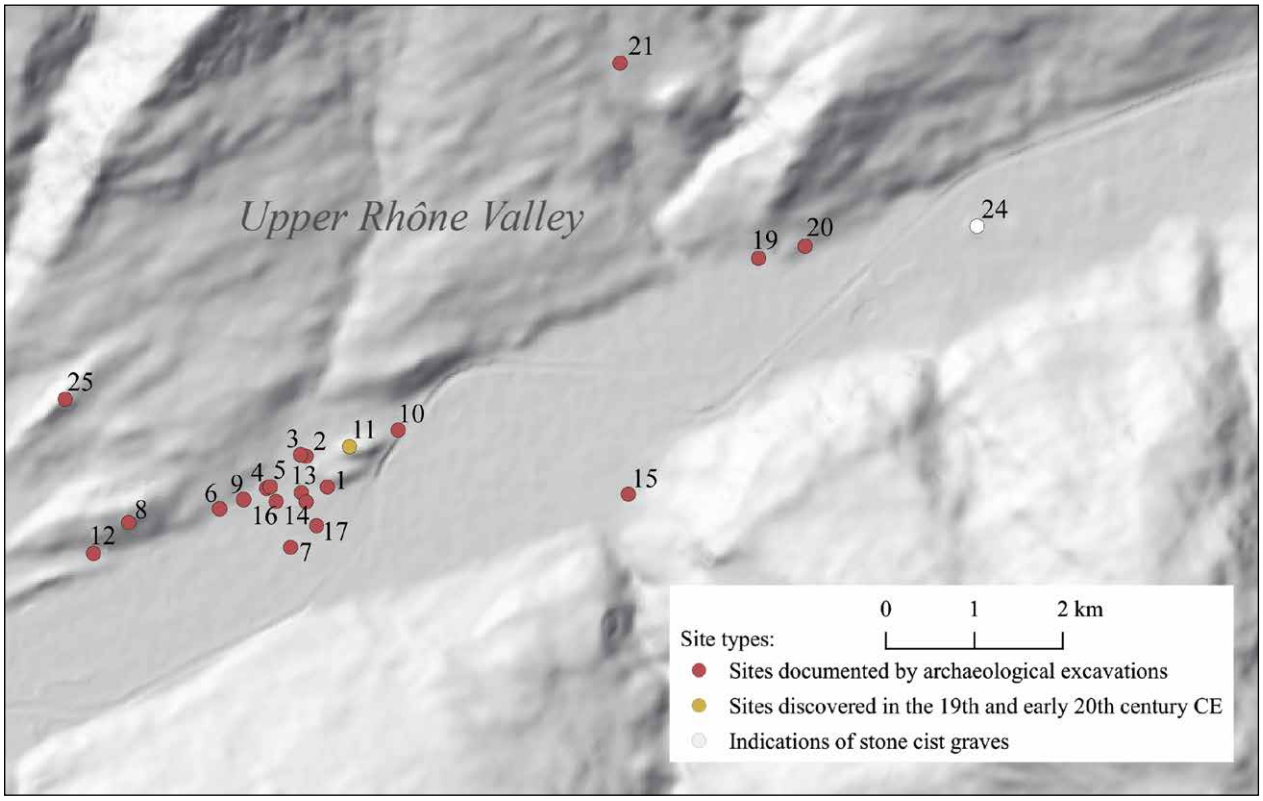
Figure 3: Map indicating the location and type of Chamblandes grave sites around Lake Geneva.

three sites were mentioned in regard to the characteristic shell bracelet grave goods (Moinat et al., 2007b, 306).

These examples aim to show that stone cist graves from the Aosta Valley have not yet been researched in detail. An extensive analysis of older French and Italian publications, as well as reports in the archives of the Soprintendenza di Aosta, shows for the first time a detailed overview of Chamblandes-type graves in this Alpine valley. Central to this evaluation were the publications of Franco Mezzena (Mezzena, 1997, 1981), who led excavation campaigns of two larger necropolises; in 1917 and 1987, stone cist graves were discovered and documented at Villeneuve, Champ Rotard. The site of Quart, Vollein (Aosta, Italy) was discovered in 1968 and fully excavated in 1983. However, stone cist graves had already been methodically documented and block extracted as far back as 1909 in Montjovet (Aosta, Italy). In addition, already in 1919, Piero Barocelli highlighted many similarities between the stone cist graves from the sites of Villeneuve and Montjovet and the Neolithic necropolises in Western Switzerland (Barocelli, 1919, 257). To sum up, reported stone cists and indications of sites discovered in the late 19th and first half of the 20th century CE resulted in a total of some ten sites with about 120 graves identified in the Aosta Valley in the context of this research project (Fig. 5).

Further to the south, in the Alpine Susa Valley, stone cist graves were discovered and excavated in 1986 in Chiomonte (Piedmont, Italy). This site was subsequently assumed to represent the most southern extent of Chamblandes-type graves (Fedele, 2007, 321–322).

On the southern shore of Lake Geneva, in present-day France, only a few stone cist graves were discovered in the 19th century CE. In 1971, an isolated grave was documented in the municipality of Lugrin (Haute-Savoie, France), and similarities to the Chamblandes necropolis or sites in the Upper Rhône Valley were suggested (Combier, 1980, 522–523). The



1	Sion, Sous-le-Scex (Valais, Switzerland)	14	Sion, Rue des Remparts (Valais, Switzerland)
2	Sion, Avenue-Ritz (Valais, Switzerland)	15	Sion, Bramois-Pranoé (Villa Chammartin) (Valais, Switzerland)
3	Sion, Ritz-Saturnales (Valais, Switzerland)	16	Sion, Arsenaux (Valais, Switzerland)
4	Sion, Chemin-des-Collines (Valais, Switzerland)	17	Sion, Avenue-de-Tourbillon/CPVAL/Tango (Valais, Switzerland)
5	Sion, Rue-des-Collines (Valais, Switzerland)	18	Sembrancher, Cretaz-Polet (Valais, Switzerland)
6	Sion, Petit-Chasseur (Valais, Switzerland)	19	Saint-Léonard, Les-Bâtiments (Valais, Switzerland)
7	Sion, La-Gillière (Valais, Switzerland)	20	Saint-Léonard, MTA (Grand Pré) (Valais, Switzerland)
8	Sion, Montorge (Valais, Switzerland)	21	Ayent, Zampon-Noale (Valais, Switzerland)
9	Sion, Saint-Guérin (Valais, Switzerland)	22	Bagnes-Villette, Les Dzardis (Valais, Switzerland)
10	Sion, Sous-Tourbillon (Valais, Switzerland)	23	Saillon, Sous-les-Bercls (Valais, Switzerland)
11	Sion, Tourbillon-Ouest (Valais, Switzerland)	24	Granges, Le Pentzet (Valais, Switzerland)
12	Sion, En Corbassières (Valais, Switzerland)	25	Savièse, Château de La Soie (Valais, Switzerland)
13	Sion, Place des Remparts (Valais, Switzerland)		

Figure 4: Map and chart indicating the location and type of Chamblandes grave sites around the municipality of Sion (Valais, Switzerland).

importance of this region for the study of Chamblandes-type graves changed dramatically with the discovery of the site of Thonon-les-Bains, Genevray (Haute-Savoie, France), in 2002. The excavation campaigns between 2004 and 2005 revealed a vast necropolis, even surpassing the sites of Pully, Chamblandes, and Lausanne, Vidy (both Vaud, Switzerland), in size and number of graves. The subsequent extensive research led to many new findings regarding grave type, related burial practices, chronology, etc. (Baudais et al., 2017).

To the south, in the Alpine Tarentaise Valley (Savoy, France), parts of a necropolis of stone cists were excavated in 1985/86 in Aime, La Plange (Savoy, France). In addition, in 1972–76 and 2003–07, a few graves were discovered on plateaus on the Le Châtelard mountain in Bourg-Saint-Maurice (Savoy, France). An association with the Chamblandes-type was suggested for both of these sites (Gély et al., 1991; Rey et al., 2012). In addition, similarities between stone cist graves discovered in the 19th century CE in Grand-Aigueblanche (Savoy, France) and the necropolises in present-day Switzerland had already been noted by Alexandre Schenk (Schenk, 1912, 485).

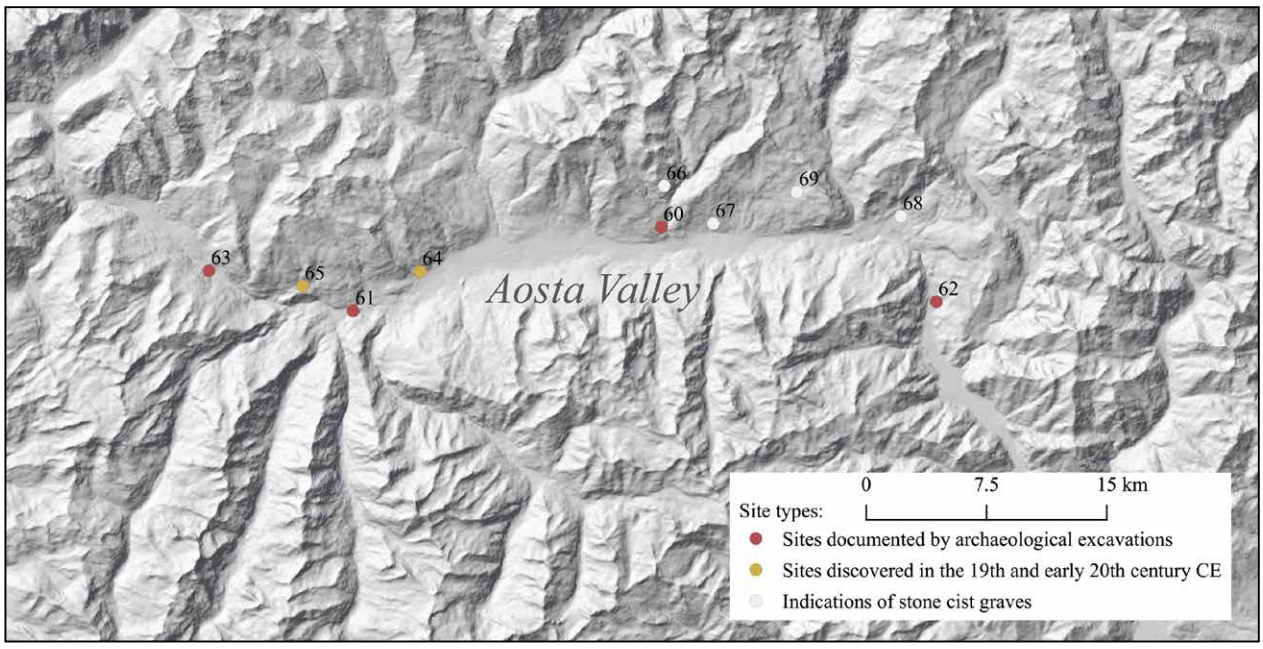


Figure 5: Map and chart indicating the location and type of Chamblandes grave sites in the Aosta Valley.

Similarly, to the West, in the department of Ain, the parallels between the stone cist graves excavated in 1959–61 at the entrance to the Grotte-du-Souhait cave in Montagnieu (Ain, France) and the necropolis of Pully, Chamblandes, were noted by the excavators (Desbrosse et al., 1961). In addition, one of the most recently discovered sites in the study area is a group of presumed wooden cists and/or pit graves excavated in 2017 in Ambérieux-en-Bugey (Ain, France), marking the (presumed) most western extent of Chamblandes-type graves (discussed in Chapter 9.2.4). However, the results have not been published yet (information from the website of the Institut National de Recherches Archéologiques Preventives INRAP and communication with Frederique Blaizot, 2020).

Focusing on the northeastern section of the study area, the research of Neolithic stone cist graves is generally less extensive in the German-speaking part of present-day Switzerland compared with the regions featured above. The first two documented stone cists were excavated in 1917/18 in Erlenbach, Geren (Zurich, Switzerland), on the northeastern shore of Lake Zurich. Marking probably the most eastern extent of Chamblandes-type graves, their assessment and dating remain difficult (Bill, 1981). In context, the most northern stone cist grave was discovered in Wettingen (Aargau, Switzerland) in 1956 (Haberbosch, 1958). Similar to other regions, little information is available for other reported stone cists and indications of sites discovered in the late 19th and early 20th century CE on the Swiss Plateau.

The most notable site in this region is the necropolis of Lenzburg, Goffersberg (Aargau, Switzerland), discovered in 1959 and (partially) excavated in 1960. In addition, two grave groups of stone cists were excavated in 1946 and 1970 in Däniken, Studenweid (Solothurn, Switzerland), and a comprehensive analysis of these stone cists was lacking until recently (Steuri and Hafner, 2022). Already, the initial excavators of both sites suggested an association of these graves with the Chamblandes-type (Dubuis and Osterwalder, 1972, 315; Wyss, 1999, 243). In addition, the discovery of the stone cist grave of Niederried (Bern, Switzerland) in 1913 is noteworthy, as it led to the publication of the first compilation of Neolithic "Hockergräber" (individuals buried in squatting or crouched position) in Switzerland, by Otto Tschumi (Tschumi, 1920).

To sum up, Swiss archaeologists have traditionally focused mainly or exclusively on sites located in present-day Switzerland. This assessment was held until very recently (e.g. Stöckli, 2016, 99, 102). In contrast, researchers from France and Italy noted similarities

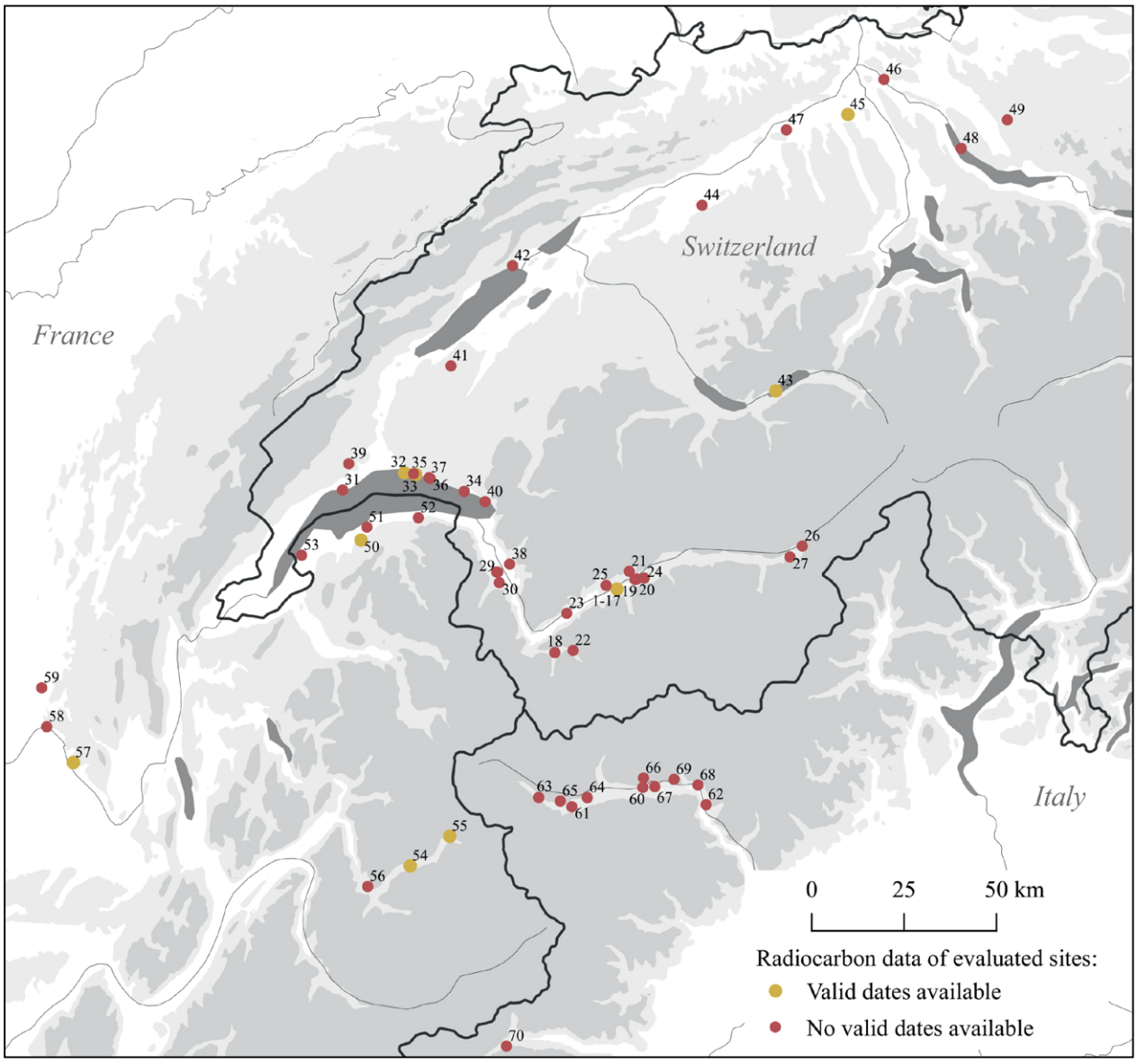


Figure 6: Map indicating the evaluated Chamblandes-type sites with and without valid radiocarbon data available previous to this study.

and connections between the stone cist graves of Savoy or the Aosta Valley and Neolithic necropolises in Western Switzerland already at the beginning of the 20th century CE.

2.1.3. State of the research

In total, some 70 sites with (presumed) Chamblandes-type graves have been identified in the regions central to this study. However, next to methodically excavated, documented and published sites, these often consist of reported stone cists and indications of sites discovered in the 19th and early 20th century with little information available (Fig. 1). In addition, the lack of available research for Neolithic stone cist graves in certain areas (for example, the Italian Aosta Valley) compared with sites in Western Switzerland has been highlighted.

The radiocarbon data of human bone samples from cist graves are covered in detail in Chapter 5.1. Some 100 valid radiocarbon dates were available previous to this study. Unfortunately, this amount of radiocarbon data is regarded as rather low to assess the evolution of grave types and burial practice(s). In addition, these data are unevenly distributed throughout the study area, as no radiocarbon dates were

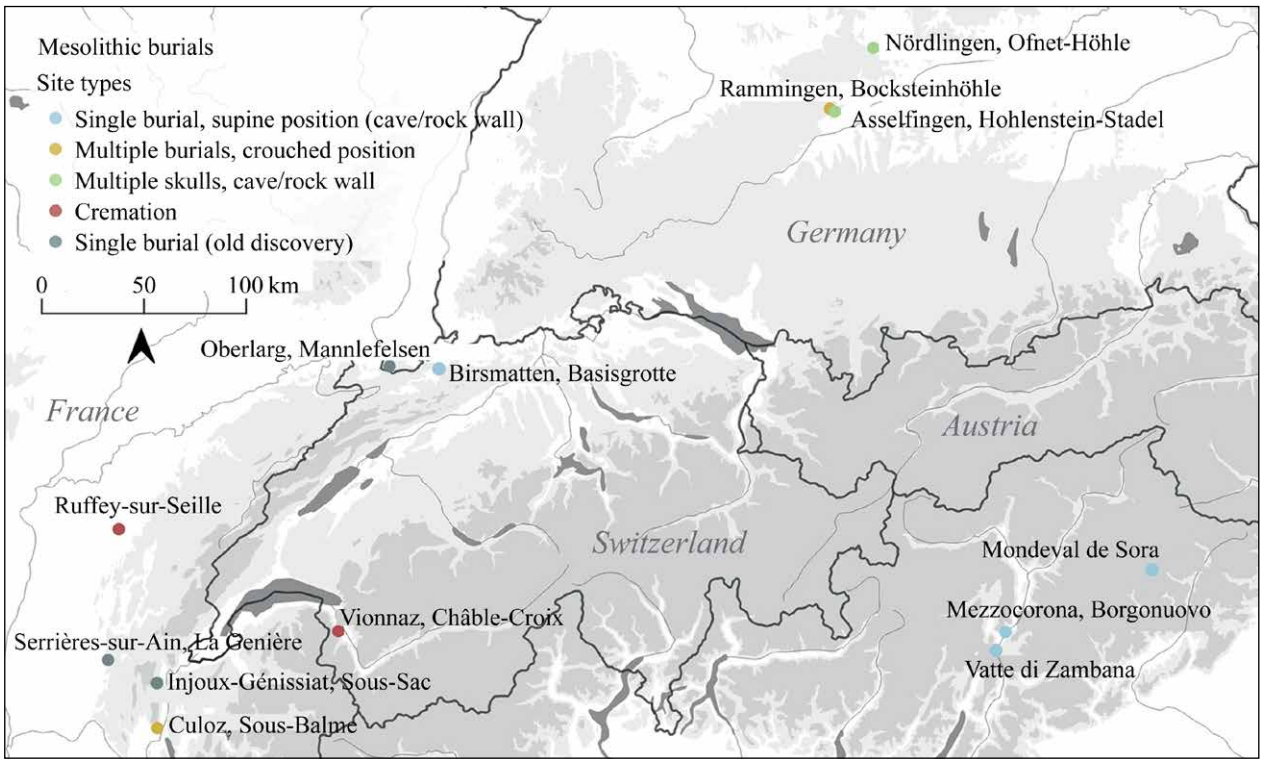


Figure 7: Map indicating the location and type of Mesolithic grave sites around the Western Alps.

available from stone cist graves of the Aosta Valley previous to this study (Fig. 6). The available dates point to the main period of use for Chamblandes-type graves between 4800 and 3800 BCE.

2.2. Archaeological context in the research area

In this subchapter, three aspects of the archaeological context of Chamblandes-type graves are outlined: first, the prior Mesolithic and Early Neolithic burial types and funerary practices in the larger Western Alpine region (Chapter 2.2.1), followed by settlement aspects and archaeological evidence for Neolithic intra-Alpine mobility (Chapter 2.2.2) and, finally, the common pottery styles in the research area dating to approximately 4500–3800 BCE (Chapter 2.2.3).

2.2.1. Mesolithic and Early Neolithic burials in the Western Alpine region

The transition from the Late Mesolithic to the Early Neolithic in the study area of the Western Alpine region is elusive and was, most probably, rather a continuous process instead of a clear-cut change. After millennia of subsistence through hunting and gathering, people experienced profound social and economic change. Cultivated plants, domesticated animals, and likely sedentariness have been proven archaeologically in central Europe from around 5500 BCE (Jacomet and Vandorpe, 2022).

Most of the few sites of Late Mesolithic burials in the study area date to the 7th millennium BCE. These show great variability in burial practices (e.g. single burials in a supine position, multiple burials in a crouched position, or cremations) (Fig. 7). Signs of groupings of graves can only be detected at the sites of Nördlingen, Ofnet (Bavaria, Germany) (two pits with the skulls of 34 individuals; Orschiedt and Kind, 2016, 376–378), and Culoz, Sous-Balme (Ain, France) (two inhumation graves; Gallay, 2008, 96).

It needs to be stated that multiple graves at the same site do not necessarily mean that the burials were contemporaneous or that the same groups of humans used it as a "cemetery". The reuse of a site may also be related to topographic factors (this counts especially for caves; Gallay, 2008, 94).

This gradual transition to a sedentary lifestyle in the Neolithic brought about a substantial change in funerary practices throughout Europe. But no Early Neolithic graves of the middle or late 6th millennium BCE can be detected in the proximate study area of the Western Alps, which, in turn, prevents us from drawing more accurate comparisons between burial practices of the Late Mesolithic and Middle Neolithic. The only burial found in modern-day Switzerland dating to the 6th millennium BCE is a single inhumation of an adult male in a crouched position in the cave of Birseck-Ermitage in Arlesheim, Basel-Country, Switzerland (three bone samples date the individual's lifetime somewhere between 5450 and 4850 cal. BCE; Moinat and Stöckli, 1995, 232). This grave shows strong similarities with Linear Pottery culture (LBK) cemeteries in the Upper Rhine region. They can be characterised as uniform, single inhumations in pits, usually on the left side in a crouched position with the head to the northeast; for example, in Wittenheim (seven graves; Vergnaud and Maurer, 2014, 61), Mulhouse-Est (22 graves; Schweitzer and Schweitzer, 1977, 15–19), or Ensisheim (37 graves; Jeunesse, 1997, 129–139), all located in the Haut-Rhin department in France, some 40–50 km north of Arlesheim.

The other bordering regions of Northern Italy (Starnini et al., 2018, 306) and eastern central France (Zemour et al., 2017, 96) are currently characterised by an absence of Early Neolithic human remains.

2.2.2. Settling the landscape and intra-Alpine mobility

The colonisation or settlement process of the inner Alpine valleys and the shores of Lake Geneva is probably related to the control of resources and trade routes (for example, of greenstone or salt) between the Po Valley, the lower Rhône Valley, and the Upper Rhine area. The choice of location of the Chamblandes-type necropolises may have been made considering aspects of visibility in the terrain and symbolic nature, and to control trade routes. The proximity to the transport axes of the valleys may also indicate a high degree of mobility and exchange networks in early Alpine societies.

The earliest pile dwelling sites in the Western Alps were found on its southern foothills, at Lake Varese (Lombardy, Italy), where the beginning of farming activities was dated to around 5000–4850 BCE (Antolín et al., 2022), while the earliest settlement of this type north of the Alps was found in Egolzwil (Lucerne, Switzerland) dating to 4300 BCE (Stöckli et al., 2013). Therefore, parts of the Neolithic community from Lake Varese could have migrated north of the Alps, possibly across the Upper Rhône Valley (Antolín et al., 2022). Radiocarbon data of Neolithic settlement layers in the region of Sion (Valais, Switzerland) date to after 4750 BCE and increase in the second half of the 5th millennium BCE (Piguet, 2011). In addition, evidence for high Alpine mobility between the Upper Rhône Valley and the Swiss Plateau during this period was found on top of the Schnidejoch mountain pass in the western Bernese Alps (Bern, Switzerland) at 2750 m a.s.l, where five wood samples of arrow shafts date to 4800–4500 cal BCE (Hafner, 2015, 239).

North of the Western Alpine region, in the Upper Rhine area (Southern Germany/ Eastern France), the oldest Neolithic settlements of the Linear Pottery Culture are followed by a phase of related ceramic styles – Hinkelstein, Grossgartach, Rössen, and Bischheim – dating to 4800–4000 BCE (Denaire et al., 2017).

These aspects of the settlement processes and the emergence of Chamblandes-type necropolises in the Western Alpine landscape in the 5th millennium BCE would need to be further developed in the context of future research projects (see Chapter 10).

2.2.3. Pottery styles in the Western Alpine region (4500–3800 BCE)

Pottery styles (e.g. typical vessel shapes or ornamental elements on ceramic objects) are an important aspect of archaeological research in assessing the age and potential "cultural" contacts or influences of excavated features. As pottery is almost completely absent from the spectrum of grave goods of Chamblandes-type burials (see Chapter 7.1), this subchapter is limited in scope and only provides an overview.

In addition, due to the almost complete absence of finds, pottery in the Western Alps in the first half of the 5th millennium BCE is hard to characterise (Denaire et al., 2011, 24–30), Therefore, the listing below focuses on the most frequent pottery styles encountered in the research area between ca. 4500–3800 BCE (see Fig. 8).

Eastern Swiss Plateau and Central Switzerland:

- The main sites of the so-called Egolzwiler pottery type consist of Zurich, Kleiner Hafner (Layer 5), and Egolzwil Station 3. Both sites are dendro- and/or radiocarbon dated to 4300–4250 cal BCE (Stöckli, 2009, 17, 55; Stöckli et al., 2013, 141). The pottery consists almost exclusively of pots (80–90%) together with a few bottles (5–10%). In addition, both sites revealed a few distinctive beakers: "Schulterbandbecher". The stylistic origin of these decorated vessels can be placed in the southern German Rössen pottery style. The pots of the Egolzwiler pottery type typically have rather straight walls and rounded bottoms (a bag-shape) with opposite handle lugs under the rim and knobs or ledges in between. In contrast, the so-called bottles are rounded vessels with a high, narrow opening and three to four lugs (de Capitani, 2013, 145; Stöckli, 2009, 48).
- The Early Central Swiss Cortaillod pottery type (or "Frühes zentralschweizerisches Cortaillod", FZC) is best represented by layers 4A–C of the site of Zurich, Kleiner Hafner. Charcoal samples date Layer 4B between 4300 and 4050 cal BCE. Typical ceramic elements are pots with an S-shaped profile, flattened bottoms, and knobs under the opening of the vessel. The bottles have a longer neck in comparison with the Egolzwil pottery type, and bag-shaped pots with handle lugs are still represented and show continuity with the preceding pottery stile (Suter, 1987, 81, 186). In the later Classical Central Swiss Cortaillod (or "Klassischen zentralschweizerischen Cortaillod", KZC), pots with an S-shaped profile, lugs under the rim, and a flattened base are still typical. Analogous to the classic Cortaillod (in Western Switzerland), bowls and segmented wall bowls ("Knickwandschüssel") with pairs of lugs with horizontal perforations are also represented in the KZC. These are less frequent in Eastern than in Western Switzerland. The pottery of the subsequent Late Central Swiss Cortaillod ("Spätes zentralschweizerisches Cortaillod", or SZC) is dominated by pots, still with an S-shaped profile and lugs under the rim, but increasingly flat-bottomed.
- The transition from the Central Swiss Cortaillod pottery type to the so-called Central Swiss Pfyn pottery type varies regionally but can be classified as fluent and is dated to 3800–3600 BCE (Stöckli, 2016, 127, 2009, 59–64). Typical are S- or V-shaped pots with silt application and flat bases, and Pfyn-style jugs with a handle.

Western Switzerland and Upper Rhône Valley:

- Starting in the late 5th millennium BCE, the pottery in these regions is characterised by different variations of the Cortaillod style. Features of Cortaillod ancient pottery are bag-shaped pots and S-shaped pots with lugs on the rim. Other typical pottery styles are flat bowls and segmented wall bowls ("Knickwandschüssel") with lugs and perforations and sporadic Chasséen-type bowls with incised rims (Stöckli, 1995, 28). After 3800 BCE, in the subsequent Classical Cortaillod, pots become rather S-shaped (similar to the Classical Central Swiss Cotaillod (Stöckli, 2016, 127).

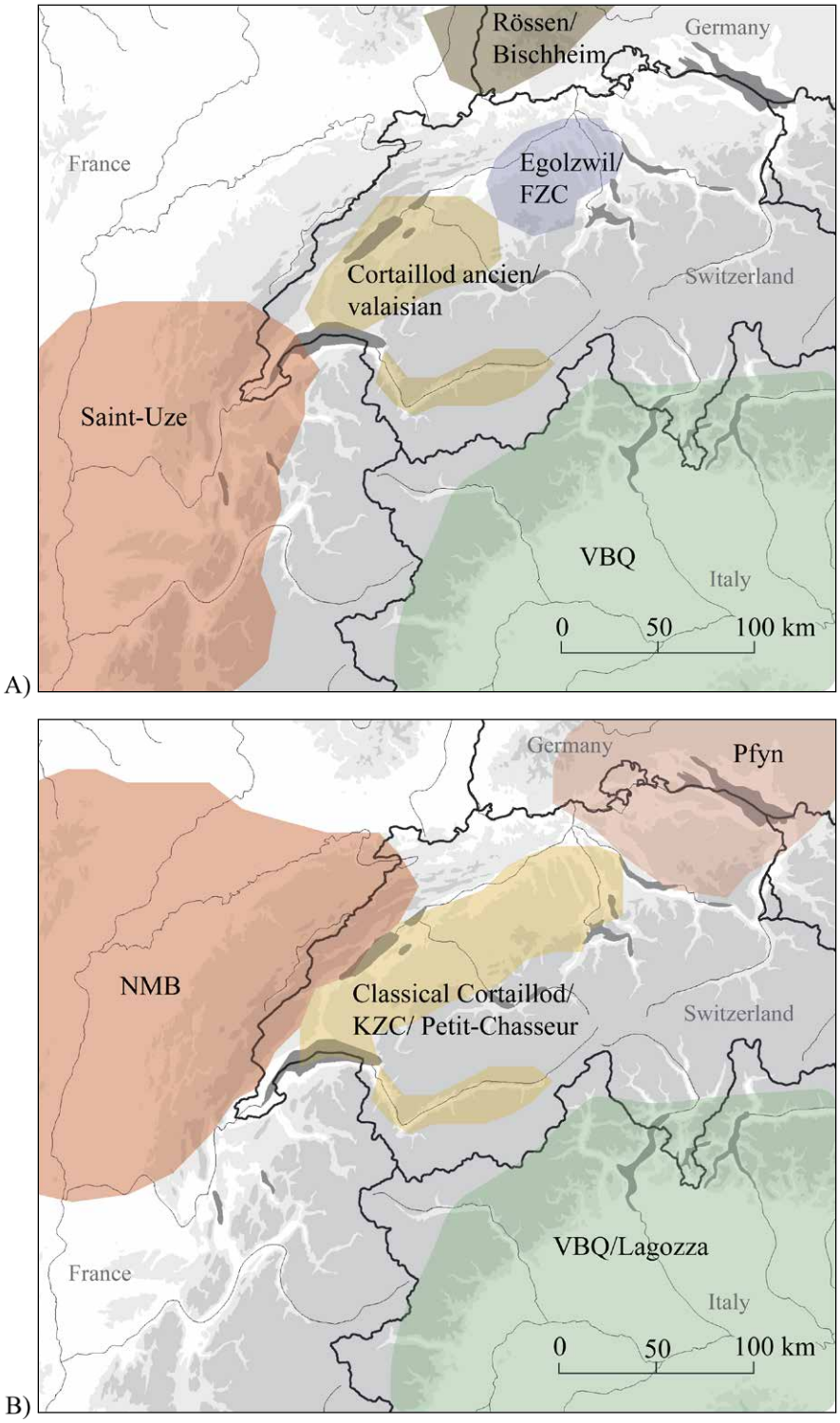


Figure 8: Maps indicating the approximate distribution of mentioned pottery styles in the study area: A) 4500–4000 BCE, B) 4000–3800 BCE.

- During this period, variations of the Cortaillod pottery style(s) are also common in the Upper Rhône Valley. These differ slightly in their vessel shapes and decorative elements, as the Cortaillod ancient valaisian (ca. 4500–4000 BCE) and the subsequent Cortaillod Petit-Chasseur variations (ca. 4000–3750 BCE) feature the typical element of fluted applications on the pots and some (probably imported) vessels from the Chasséen and VBQ pottery styles (Stöckli, 1995, 26–28).

Eastern France:

- The pottery of the Saint-Uze style is similar to the Egolzwil pottery style with bag-shaped pots with opposite handles and smaller lugs on the rim. In addition, bowls with high rims and tunnel lugs or vessels with segmented walls or pronounced shoulders ("Knickwand") are typical (Stöckli, 2016, 102–104). Its core distribution area is centred along the French Rhône Valley and dates to 4400–4000 BCE (Denaire et al., 2011, 49).
- Arguably, the Saint-Uze pottery style developed into the Chasséen (Stöckli, 2016, 104). Bag-shaped pots with opposite handle lugs are still frequent. Characteristic to the Chasséen are bowls with elongated, flat, incised rims and vessels with segmented walls ("Knickwand"). This pottery style is prevalent mainly in Southern and Eastern France (along the Rhône and Saône rivers) between the second half of the 5th to the middle of the 4th millennium BCE (Denaire et al., 2011, 46–48).
- The Néolithique moyen bourguignon (short NMB) was found mainly in Eastern Central France and at a few sites in Western Switzerland. The pile dwelling settlements at Clairvaux-les-Lacs (Franche-Comté, France) and Concise (Vaud, Switzerland) date this pottery style between 3900 and 3650 BCE. Typical is chalk temper in clay (Stöckli, 2016, 118), and a majority of the vessels are pots with segmented walls or pronounced shoulders ("Knickwand") with lugs placed on the shoulders and flattened bases (Pétrequin et al., 2015, 518).

Northern Italy:

- The vasi a bocca quadrata (VBQ) culture is named after its most prominent feature, pottery with a square opening or "mouth". This style spread across Northern Italy, with a few sherds found in Western France, the Upper Rhône Valley, and the Lake Geneva region. The VBQ was common throughout the 5th millennium BCE and subdivided into three phases (I to III) based mainly on variations in decorations (Denaire et al., 2011, 23, 42).
- After 3800/3700 BCE, the VBQ was superseded by the Lagozza pottery style, which shares many elements of the classical Cortaillod pots and bowls (Stöckli, 1995, 33).

2.3. Concepts of burial archaeology

In this subchapter, a glossary of the used terminology regarding burial practices is provided (Chapter 2.3.1). This is followed by how this books approaches the aspects of rituals, grave goods, and gender in the context of burial archaeology (Chapter 2.3.2).

First, the archaeological study and interpretation of burials in the past century can be divided into four general approaches:

- In the cultural-historical approach (first half of the 20th century CE), funerary practices were considered to be representing religious ideas (Stratton, 2016, 23).
- For the functionalist processual or new archaeology of the 1960s, burials depicted the degree of ranking the deceased had within their society (Brown, 1981, 25). The status of individuals was assumed to be symbolised by grave goods, grave location, or construction (Stratton, 2016, 28).
- For the post-processualists of the 1980s, burial practices were seen as legitimising existing social rankings and reinforcing underlying ideologies. Collective graves were seen as a sign of group solidarity and egalitarianism, which does not necessarily reflect social reality, but an ideological notion (Shanks and Tilley, 1982, 150).
- Since the 1990s, feminist and gender archaeology has focused on aspects such as sex, gender and age classes. Gender is seen as socially constructed through material culture, and burial practices represent societies' (idealised) understanding of gender identity (Stratton, 2016, 43–45).

2.3.1. Terminology regarding burial practices

In the subsequent chapters, a list of definitions is provided and different burial practices are discussed (according to the understanding in this work; Duday, 2009, 2006; and Knüsel, 2014):

A primary burial refers to a skeleton that was found in the same posture as it was placed at the time of the burial, meaning in situ, at the same place of decomposition. Secondary burials are human remains that were not deposited (found) at the original site of decomposition. Thus, human remains that were found in the secondary position are no longer in their original (in situ) position. This displacement of bones within a grave can have several causes. Next to natural disturbances (e.g. taphonomic processes or groundwater), they are often associated with successive primary burials, denoting the practice of manipulating (displacing and/or partially removing) human remains of preceding (primary) burials in a grave prior to the placement of another individual to make space. This manipulation indicates an advanced decomposition stage for these older burials. The removal of some skeletal elements from the graves is also called reduction (French "réduction").

In general, it is difficult to judge whether individual bones come from secondary burials or represent remains of partially removed primary burials. Therefore, the neutral term of surplus bones was used (French "os surnuméraire"; Baudais et al., 2017, 101), and Esther Gatto posed the question of whether these remains should symbolise an individual or if these bones were taken from another grave to symbolise a certain relationship between the deceased. Therefore, it is also possible that these bones were a kind of grave good and/or were meant to symbolise a missing person as a stand-in (Baudais et al., 2017, 115).

A single burial refers to a grave containing the remains of a single individual. If it can be assumed that several individuals were buried contemporaneously, these graves are named multiple burials. In contrast, a collective grave contains the remains of several individuals buried in succession, often with multiple distinguishable usage phases. When contemporaneity or succession cannot be determined, Philippe Chambon proposed to use the neutral term plural burials (Chambon, 2000, 271).

2.3.2. Rituals, grave goods, and gender

The Chamblandes-type necropolises show that the community made a conscious decision to bury their deceased in a designated area in a particular way. This indicates that the burial ritual was a public display for the prehistoric society (Stratton, 2016, 79). In addition, necropolises are seen as part of the cultural memory of the prehistoric society (Hofmann, 2013, 285), since the society was reproduced through the repeated practices and the witnessing of these practices. Aspects such as gender, age, status, and other social roles were reproduced in the mortuary sphere (Stratton, 2016, 347). In addition, the placement of the body itself is informative, as a majority of burials within a site conform to a certain position. The placement of bodies deviating from the norm poses several questions. Why were they not considered to qualify for the usual method of burial? What is it about them that qualifies for a different method (Stratton, 2016, 343)?

Practices, rituals, and customs: Archaeological research tries to reconstruct human practices on the basis of finds and features. The repeated observation of the same finds and features provides the basis for the characterisation of a certain practice. This practice can correspond to a ritual if ceremonial actions are suspected. Importantly, rituals should be seen as dynamic processes, not as a detached category of actions. Graves and their contents are the results of intentional and structured actions, conceptualised as rituals (Ekengren, 2013). In this study, recurring patterns regarding the recognised rituals within a certain geographical area are regarded as a wider-spread custom of the local, prehistoric society during a certain period.

According to Catherine Bell, rituals are tools to convey certain information. They are not spontaneous improvisations without intentions, and each participant may have his or her own understanding, explanation, and interpretation of the performed rituals (Bell, 1997, 82–83, 1992, 123–124). In addition, burial practices are not a reflection of the lived experience, as the living choose how a person is represented in death (Parker Pearson, 1999). The way communities react to death is a complex mixture of tradition, belief, politics, and emotion. The choice of how and with what items an individual is buried depends on what those who buried the individual wish to convey to others (Stratton, 2016, 76).

Grave goods: The objects found within graves are one key source for the archaeological interpretation of prehistoric societies. Unfortunately, typical for Neolithic burials, Chamblandes-type graves often do not contain many, if any, grave goods. It needs to be kept in mind that this only refers to items that are detectable now, unlike degradable materials such as fabric. For example, it is highly likely that all individuals were clothed at the time of their burial. Thus, other objects made of organic materials are lost to us. Consequently, we only have a partial picture of these graves. With that in mind, it is impossible to guess what was originally placed within these graves, shifting the focus to the items that actually survived (Stratton, 2016, 336).

Everyday items people used played an important role in the "creation of individuals". Thus, when placed in a funerary context, such items are indicators of who the deceased was during his or her lifetime (Stratton, 2016, 82). Contrary to previous archaeological theoretical approaches, graves should not be understood as a black box containing all the necessary clues to explore the composition of prehistoric societies (such as aspects of social status, gender roles, or beliefs), as it is not certain that objects found in graves can be directly associated with the buried individual(s). In addition, the function and meaning of this material culture are not static, but dependent on context. In general, a complex relationship between ideology, actions, and material culture must be assumed (Ekengren, 2013). Designating objects found within graves as grave goods, personal equipment of the deceased, ritual objects, or remains of performed ceremonies is already an interpretation that contains social implications. Therefore, it needs to be defined clearly under which aspects such classifications were made. For a more objective approach, Fredrik Ekengren proposes using the term material culture (Ekengren, 2013). The body of the deceased individual should also be seen as part of the material culture, as it was also an object of action and became a means of expression (Hallam and Hockey, 2001). Therefore, to differentiate between human remains, the term "grave good" is used in this work as referring to items that were intentionally placed within the grave. In addition, it is regarded as impossible, in most cases, to verify whether these objects were part of the everyday life of the deceased, newly made for the burial (as part of the mortuary costume), and/or used in the performance of rituals (Stratton, 2016, 77).

Meaning and function of objects: Fredrik Ekengren proposes the contextualisation of grave goods in order to better understand the function and (social) meaning of these objects within the burial context. Since graves are understood as the result of a sequence of transformative actions (e.g. the performed burial rituals), the idea of a grave good as the result of a singular event needs to be reconsidered (Ekengren, 2013). Victor Turner offers an approach according to which a distinction must be made between three levels of meaning: 1) The meaning attached to the objects by its users; 2) the operational meaning of objects, i.e. how they were used; and 3) the positional meaning of objects, i.e. how they relate to other objects or features. Therefore, objects must be examined within their context to understand the meaning attributed to them, especially as the same object can have different meanings at different stages of the ritual (Turner, 1967, 22, 50–51).

In practice, objects should be approximated to their context according to the following aspects (Ekengren, 2013):

- Intentionality: Which deposits were intentional and thereby which ritual actions took place during the burial?
- Ritual sequences: As recurring patterns in the material culture of graves are indications of formalities, they may have been central in some burial rituals.
- Spatial arrangement: The analysis should not only focus on types and categories of objects, but also include how the objects are positioned in relation to other material culture (including the body of the buried individual).
- Typology and physical characteristics: Size, material, texture, or condition at the time of deposition can provide clues as to how objects were perceived during the burial rituals.

Gender: Gender is seen as the cultural elaboration of sexual differences in a system of values and personal identities (Robb and Harris, 2018, 15). Key evidence for prehistoric gender expression includes grave goods that can be linked to sex-determined human remains (Robb and Harris, 2018, 2). Sex and gender are not mutually exclusive, but must be understood as interrelated aspects. Moreover, gender is not a state, but rather a process and performance that can be understood as an identity, whereby the determination of the gender of an individual is not detached from other social categories, such as age class, kinship, or status (Hofmann, 2014, 111). Western archaeologists used to view prehistoric societies in terms of binary gender categories, transmitting their cultural understanding, however, the value systems of past societies may have been very different from the present ones (Stratton, 2016, 69, 73).

The European Bronze Age often displays clear dichotomies of grave goods or funerary practices based on the sex of the buried individuals. In particular, certain objects appear to have been clearly "gendered". In contrast, Neolithic burials were usually not gendered, with little to no difference in positioning or grave goods between males and females (Robb and Harris, 2018, 2–4, 13). There are some exceptions, for example, in the so-called Cerny group (around 4500 BCE in the Paris Basin), where arrowheads are buried exclusively with adult males, possibly linking male identity to hunting (Robb and Harris, 2018, 11). Archaeological evidence suggests Neolithic gender clearly differed from the dichotomy of the Bronze Age, which indicates that gender expressions are neither universal nor inevitable.

3 Methods

In this chapter, the approaches to investigate the research aims (Chapter 1.1) are stated. First, the specific research area and the rationale behind its subsequent partition into "zones" are outlined (Chapter 3.1). Second, the reasoning for the choice of assessed sites in the defined zones is discussed (Chapter 3.2). This aspect is central, as the source evaluation of selected Chamblandes-type graves will provide the basis for the three subsequent main approaches to assess the evolution of burial practices in the Western Alpine region between 4800 and 3800 BCE (Chapter 3.3).

3.1. Research area and geographical zones

The distribution of Chamblandes-type grave sites (covered in Chapters 2.1.2 and 2.1.3) across the Western Alps of today's Italy, France, and Switzerland provides the focus of this study. The distribution is characterised by three major valleys situated on both sides of the Alpine ridge, the shores of Lake Geneva, and the Swiss Plateau. The valleys – the Upper Rhône, Aosta, and Tarentaise valleys – are connected via high Alpine passes. For example, the Great Saint Bernard over the Valais Alps connects the Upper Rhône and the Aosta Valley, while the Little Saint Bernard over the Graian Alps provides access between the Aosta and Tarentaise valleys. Both of these major Alpine passes reach altitudes of over 2000 m above sea level. Similarly, multiple passes over the Bernese Alps connect the Upper Rhône Valley and the Bernese Oberland, which, in turn, merge into the Swiss Plateau. This plain on the northern foothills of the Alps is delimitated by the Jura Mountains and Lake Constance in the north and Lake Geneva in the south. The latter is the largest lake in the Alps and, right after Lake Balaton (Hungary), the largest in Central Europe. To the east, the Upper Rhône Valley leads into Lake Geneva. This outline illustrates that, even though the research area is delimitated by natural features such as high mountain ranges or major rivers, it is interconnected and was frequented in prehistoric times. These regions refer to three river catchment areas, as the Aosta Valley drains into the Po River, while the sites located on the Swiss Plateau are located along tributary rivers of the Rhine. In contrast, the Upper Rhône Valley, as well as Lake Geneva, are both in the catchment area of the Rhône, and the Tarentaise is a valley of the Isère River, itself a tributary of the Southern Rhône (Fig. 9).

In order to facilitate a consistent assessment, the defined research area was further subdivided into zones based on specific geographical features, consisting of the three inner Alpine valleys of the Aosta, Tarentaise, and the Upper Rhône, as well as the southern and northern shore of Lake Geneva and the Swiss Plateau (Fig. 10). In addition, a selection of the few isolated sites located on the peripheries of these six defined zones will be assessed separately.

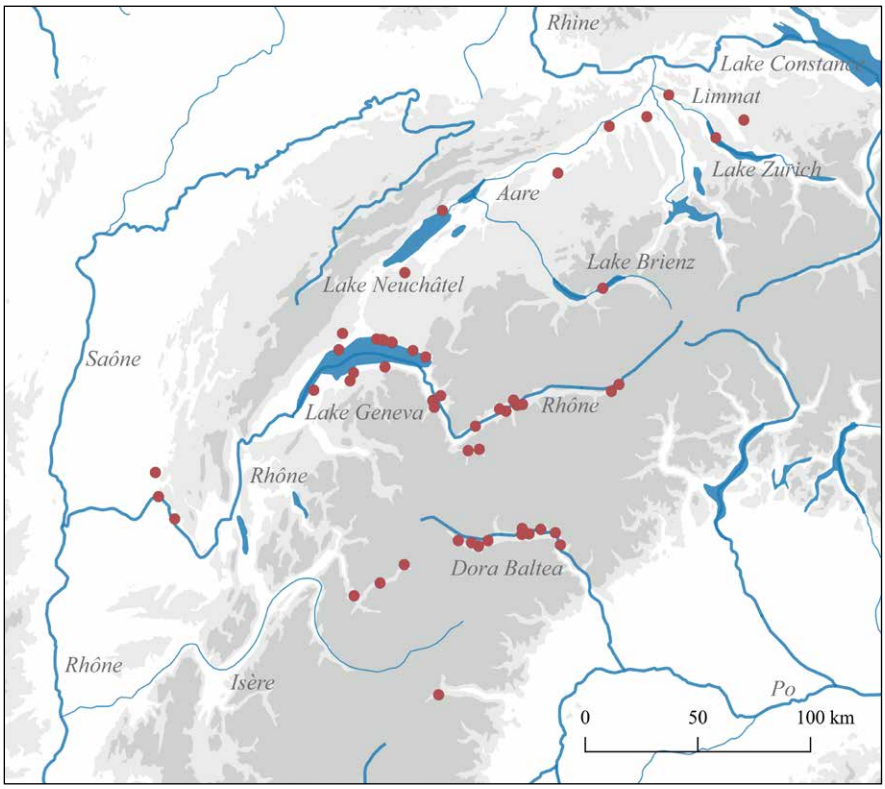


Figure 9: Map depicting the major rivers and lakes in the study area in relation to the identified Chamblandes-type sites.

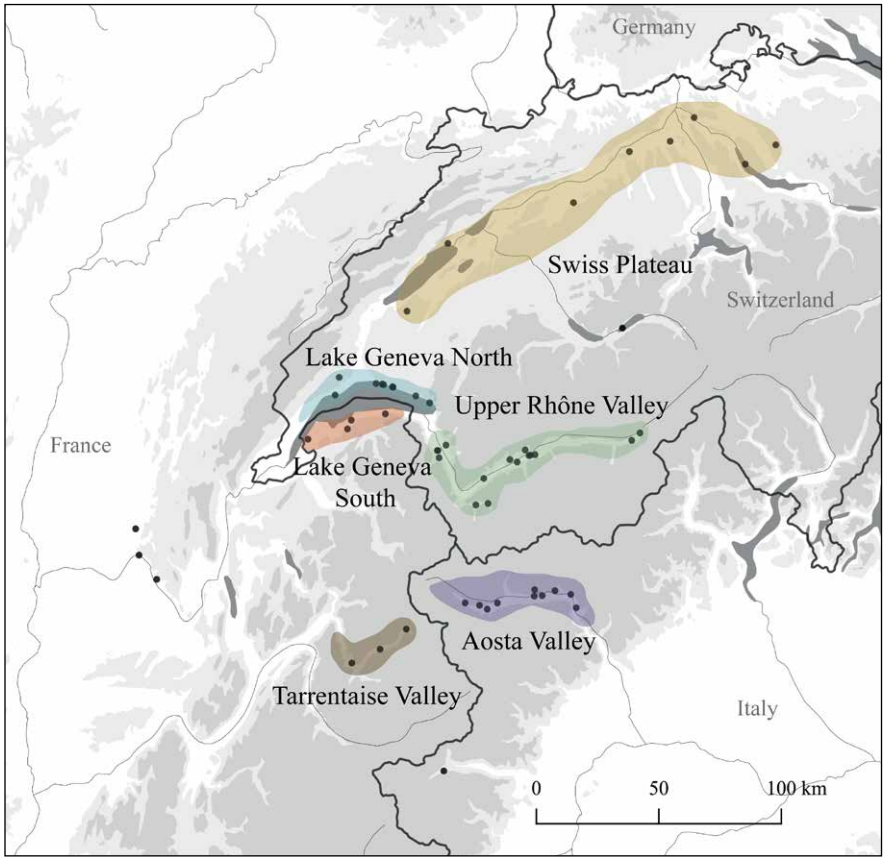


Figure 10: Map depicting the defined geographical zones in the study area.

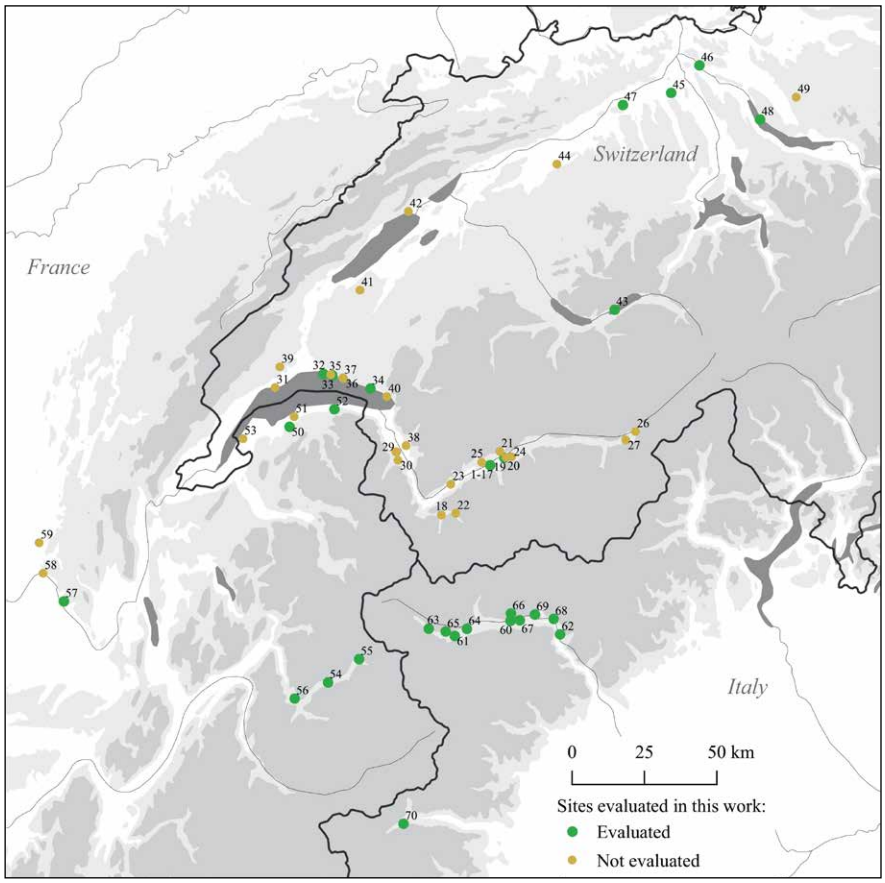


Figure 11: Map depicting Chamblandes-type sites evaluated in this work.

3.2. Evaluation and choice of sites

A comprehensive and consistent listing of the available data of chosen sites provides the basis for assessing the evolution of burial practices in the Western Alpine region. This inventory consists of the context and research background of the site, followed by the spatial analysis and, for particular sites of special interest, individual grave descriptions. The original denominations of the initial researchers of the graves are kept, in order to facilitate comparability. Finally, an overview of the detected burial practices and grave goods is provided. For each defined zone, the focus will be on one to three necropolises, exhibiting significant features and extensive available literature. This listing is supplemented information from sites where only limited data are available, consisting of other necropolises, grave groups, isolated stone cists, and/or discoveries of the 19th century CE; they are referred to as "outlined sites" (Fig. 11).

- Neolithic stone cist graves in the Aosta Valley (Italy) are one of the main focuses of this study. The limited previous research in this region has been highlighted (Chapter 2.1.2); therefore, an extensive assessment of the available literature and research in the archive of the Soprintendenza di Aosta was needed. The focus was on the two large necropolises of Quart, Vollein (Aosta, Italy), and Villeneuve, Champ Rotard (Aosta, Italy), as well as the grave group of Montjovet, Fiusey (Aosta, Italy). The outlined sites in this zone consist of the isolated documented grave of La Salle, Derby (Aosta, Italy), as well as six 19th-century discoveries and/or undocumented destructions of stone cist graves.
- Few data are available for Neolithic stone cist graves in the Tarentaise Valley (France). Thus, this study considered the only known necropolis of Aime, Le Replat (Savoy,

France) and the grave group(s) of Bourg-Saint-Maurice, Le Châtelard (Savoy, France). The only outlined site in this zone consists of a 19th-century discovery of stone cist graves in Bellecombe, Torrent du Morel (Savoy, France).

- The extensive research of Chamblandes-type graves in the Upper Rhône Valley (Switzerland) has already been highlighted (Chapter 2.1.2). The main focus of this study was on the two sites of Saint-Léonard, Les-Bâtiments (Valais, Switzerland), and Sion's Place et Rue des Remparts (Valais, Switzerland), as they both exhibit unique and significant features not highlighted by previous studies in this region (e.g. collective graves and larger amounts of grave goods). The five outlined sites in this zone are all located within the municipality of Sion (Valais, Switzerland) and consist of the three necropolises of Sous-le-Scex, Chemin-des-Collines, and Avenue Ritz, as well as the small grave group of Montorge and the single stone cist of En-Corbassière. Other relevant sites would be the two necropolises of Collombey-Muraz, Barmaz (Valais, Switzerland), with 36 stone cists and three pit graves, and 20 stone cist graves, respectively. However, as a new evaluation is currently ongoing, these sites will not be included in this study, though the published data (Honegger and Desideri, 2003, 221) were taken into account and they do not seem to divert from the chronology or evolution of the Neolithic cist graves in the Upper Rhône Valley as proposed here (Chapter 8).
- On the southern shore of Lake Geneva (France), the investigation focused on the vast necropolis of Thonon-les-Bains, Genevray (Haute-Savoie, France). The only outlined site covered in this zone consists of a single stone cist discovered in Lugrin, Le Petit-Tronc (Haute-Savoie, France).
- Due to the lack of published data, the two large necropolises on the opposite northern shore of Lake Geneva (Switzerland), Pully, Chamblandes (Vaud, Switzerland), and Lausanne, Vidy (Vaud, Switzerland), could only be covered to a limited extent. Here, the focus was on the graves discovered at Corseaux-sur-Vevey, En-Seytion (Vaud, Switzerland).
- Moreover, the Neolithic stone cist graves located on the Swiss Plateau (Switzerland) were also included in this study. The main evaluated sites consist of the two known necropolises of Lenzburg, Goffersberg (Aargau, Switzerland), and Däniken, Studenweid (Solothurn, Switzerland). In addition, the available data of the isolated stone cist graves of Wettingen, Schartenstrasse (Aargau, Switzerland), and Erlanbach, Geren (Zurich, Switzerland), were covered.
- Regarding the sites located on the peripheries of the defined zones, the focus was on the grave groups of Chiomonte, La Maddalena (Piedmont, Italy), and Montagnieu, Grotte-du-Souhait (Ain, France), as well as the practically unknown, isolated stone cist of Niederried, Ursisbalm (Bern, Switzerland), located in the northern Prealps.

3.3. Assessment approaches

This subchapter focuses on the assessment of three specific aspects of the evaluated sites (listed in Chapter 3.2). These consist of the evaluation of previously available and new radiocarbon data of human remains (Chapter 3.3.1), the recognisable burial practices in relation to the human remains (Chapter 3.3.2), and the origin or typology of grave goods (Chapter 3.3.3). The combined evaluation of these results subsequently enables us to discuss the evolution of burial practices and track funerary customs in the Western Alpine region between 4800 and 3800 BCE. Additionally, an outline of 5th-millennium BCE funerary customs in neighbouring Southeastern France and Northwestern Italy allows us to assess Chamblandes-type graves in the broader geographical and cultural context.

3.3.1. Radiocarbon dating

A precise chronology was required to retrace the origin and spread of Chamblandes-type graves across the region under investigation in this study. Due to an almost complete lack of distinctive grave goods, this could only be achieved with a larger series of radiocarbon dates of human remains found within cist graves. Hence, the available radiocarbon data from the chosen sites (Chapter 3.2) were first evaluated, focusing on quality and quantity (Chapter 5.1). This revealed a relatively low number of considered valid dates overall, and more importantly, the complete lack of radiocarbon data for some geographical zones or key sites. Subsequently, the sampling strategy in the context of this study was based on these results, as the aim of establishing a precise chronology could only be achieved with a series of modern radiocarbon dates covering all geographical zones. The sampling strategy (Chapter 5.2) was affected by the availability and preservation of human remains, as well as the state of research (or collaboration). After an onsite screening of the accessible bones, the sampling choice was made based on the available archaeological and anthropological documentation. The subsequent bone sample treatment followed state-of-the-art protocols and quality control criteria (Chapter 5.3). This resulted in a larger series of new data (Chapter 5.4), covering not only sites but entire zones previously lacking dates obtained through radiocarbon dating. Consequently, the combination of the previous and new radiocarbon data allowed for the modelling of the emergence, spread, and evolution of Neolithic cist graves in the Western Alpine region (Chapter 8.1).

3.3.2. Evaluation of burial practices

Based on the comprehensive listing of the available data of the chosen sites (Chapter 4), detectable aspects indicating specific burial practices within the defined geographical zones were assessed. The approach was divided into two subsections. The first covered the spatial organisation of the necropolis, as aspects such as grave architecture, accessibility, or size of grave sites are related to, or influenced by, the performed rituals (Chapter 6.1). The second subsection was centred on the treatment of the human remains within the sites; for example, the average minimum number of individuals (MNI) per grave, the ratio of multiple burials, and the ratio of unmanipulated primary burials (Chapter 6.2). In combination, the consideration of these aspects with the available radiocarbon data allowed for the delineation of the evolution of burial practices within the area under investigation (Chapter 8.2).

3.3.3. Evaluation of grave goods

Similar to the burial practice evaluation, the evaluation of grave goods is based on the objects found in the chosen sites (Chapter 4). First, the data were compiled for the zones (Chapter 7.1) in order to assess the general characteristics, regional preferences, and frequency of certain types of items within Neolithic cist graves. Subsequently, the (likely) origins of the raw material for objects made of flint, jet, and seashell were discussed (Chapter 7.2). This assessment was completed by the typological evaluation of specific types of grave goods – mainly pottery, stone axes, and ornamental objects made of limestone, seashells, or perforated animal teeth (Chapter 7.3). The rationale was that both aspects – the origin of the raw material and typology of certain items – could point to exchange or trade networks between zones of the Western Alps and the broader geographical context. Finally, combined with insights from the radiocarbon data, these results allow us to discuss the potential role of grave goods in the burial practice, as well as the regionality and chronology of these objects (Chapter 8.3).

4 Evaluated sites

The following section comprises a comprehensive and consistent listing of the available data of selected sites of Neolithic cist graves in the study region (regarding site selection, see Chapter 3.2. and Fig. 11). It is divided into subchapters representing the defined geographical zones, specifically the Aosta Valley (Chapter 4.1), the Tarentaise Valley (Chapter 4.2), the Upper Rhône Valley (Chapter 4.3), the southern shore of Lake Geneva (Chapter 4.4), the Northern shore of Lake Geneva (Chapter 4.5), the Swiss Plateau (Chapter 4.6), and sites located on the peripheries of these geographical zones (Chapter 4.7).

4.1. Aosta Valley

The research focus within this zone was on the two necropolises of Quart Vollein (Chapter 4.1.1) and Villeneuve Champ Rotard (Chapter 4.1.2), as well as on the group of graves of Montjovet, Fiusey (Chapter 4.1.3). The outlined sites (Chapter 4.1.4) consist of the isolated documented grave of La Salle, Derby, as well as six 19th-century discoveries and/or undocumented destructions of stone cist graves (for the location of sites, see Fig. 5).

4.1.1. Quart, Vollein

I. Context

The site, consisting of up to 66 stone cist graves, is located on a plateau below the small village of Vollein (part of the municipality of Quart), about 15 km east of the city of Aosta. It is situated at an altitude of about 912 m on a ridge of the southern slope of the Croix-de-Fana.

The uneven topography of the slope was formed during Quaternary glaciation. At the foot of the slope flows the Dora Bàltea River (at an average elevation of 535 m). The plateau of the necropolis is delimited to the east and west by rocky slopes and subglacial channels (Giardino et al., 2005, 104–108).

The southern area of the necropolis was affected by agricultural activities, while the graves closer to the slope were covered by more sediment due to erosion and therefore show a better state of preservation (Mezzena, 1997, 39).

Following the discovery, the regional government of Aosta bought the plot of land in order to preserve the archaeological features for later investigations (Mezzena, 1981, 21). In the context of this research project, it was decided to erect three large information boards telling visitors about the site.

II. Background

Farmers found multiple graves formed of stone slabs during ploughing work on the plateau. They informed Damien Daudry, secretary of the Société de Recherches et d'Etudes préhis-

toriques alpines d'Aoste, who visited the site on March 23, 1968, together with Dr. Rosanna Mollo of the Soprintendenza of Aosta (Daudry, 1969, 222). The archaeological excavation of the site began in the spring of the same year, and a total of 43 stone cist graves were found. Several of these had already been disturbed by agricultural activities (Mezzena, 1981, 17–18).

The discovery of the so-called Area Megalitica of Saint-Martin-de-Corléans in Aosta in the same year (1969) interrupted the excavation of the necropolis for a long period (Mezzena, 1982, 157). Under the direction of Franco Mezzena, the research of the site was continued as late as autumn of 1983. During this excavation, it was possible to excavate the necropolis in its entirety, with the number of graves increasing to a total of 66 (named T1 to T66). Simultaneously, rock carvings were discovered next to the northern flank of the necropolis (Mezzena, 1997, 34–35).

Franco Mezzena defined the stratigraphic sequence during the 1983 excavation in the eastern half of the necropolis as follows (Mezzena, 1997, 35–38):

- Layer 0, bedrock of round humps: According to Marco Giardino, they were formed during glaciation (Giardino et al., 2005, 106).
- Layer 1, sterile base layer: Boulder clay with silt of greenish-grey to yellow colouration.
- Layer 2, sandy clay sediment of yellowish-brown colour: The grave floor and foundation trenches of the lateral stone slabs of the cists were formed/cut in this layer. The stacked stone fence/wall in the northern area of the necropolis was built directly onto Layer 2.
- Layer 3, dark brown to purple sandy clay: Most probably, this is the Neolithic ground level for the construction of the stone cist graves.
- Layer 4, fine, reddish-brown clay.
- Layer 5, heterogeneous, reddish-brown layer with gravel.
- Layer 6, heterogeneous, yellow-brown layer.
- Layer 7, topsoil: Due to agricultural activities, layers 4 to 7 are disturbed/mixed.

III. Spatial organisation of the necropolis

The necropolis covers a rectangular area of about 30 m by 20 m, with more or less closely grouped stone cist graves (Fig. 12). A total of 66 graves has been detected; however, Franco Mezzena assumes that the cemetery might have extended into the northwestern direction and consisted of about 20 additional stone cists (Mezzena, 1997, 39).

A cluster of stacked stone fragments was found in the north of the necropolis and identified as a wall or fence. The absence of stone cist graves beyond this feature suggests that it could have had a delimitating function (Giardino et al., 2005, 110). The absence of graves north of this feature could also be related to erosion. Franco Mezzena assumes this fence to be younger than the stone cist graves, as some stacked stones were found on top of pottery fragments with Bronze Age decorations (Mezzena, 1997, 39). Additionally, the second sketched fence or wall stretching across the centre of the necropolis is stratigraphically younger and related to the later Bronze Age features.

Carvings of lines, dots, and simple forms were found on the rock surface north of the necropolis. These engravings have been discussed by Mezzena and Morandi, and they suspect a contemporaneity between the stone cist graves and rock carvings, referring to similarities at Saint-Léonard (Mezzena and Morandi, 1992, 387). Others have suggested these rock carvings to be related to the later Bronze Age occupation of the site (Arcà et al., 2014, 53). Due to the lack of stratigraphic information, the chronological classification of such features is generally rather difficult (Corboud, 2003, 275).

IV. Individual grave description

Based on the limited available data, it is not possible to give an account of the individual graves at this site. Relevant information is summarised in the subsequent sections.

Grave architecture: Generally, four lateral stone slabs formed a cist of rectangular shape, where the narrow sides are often slightly recessed or framed by the long sides

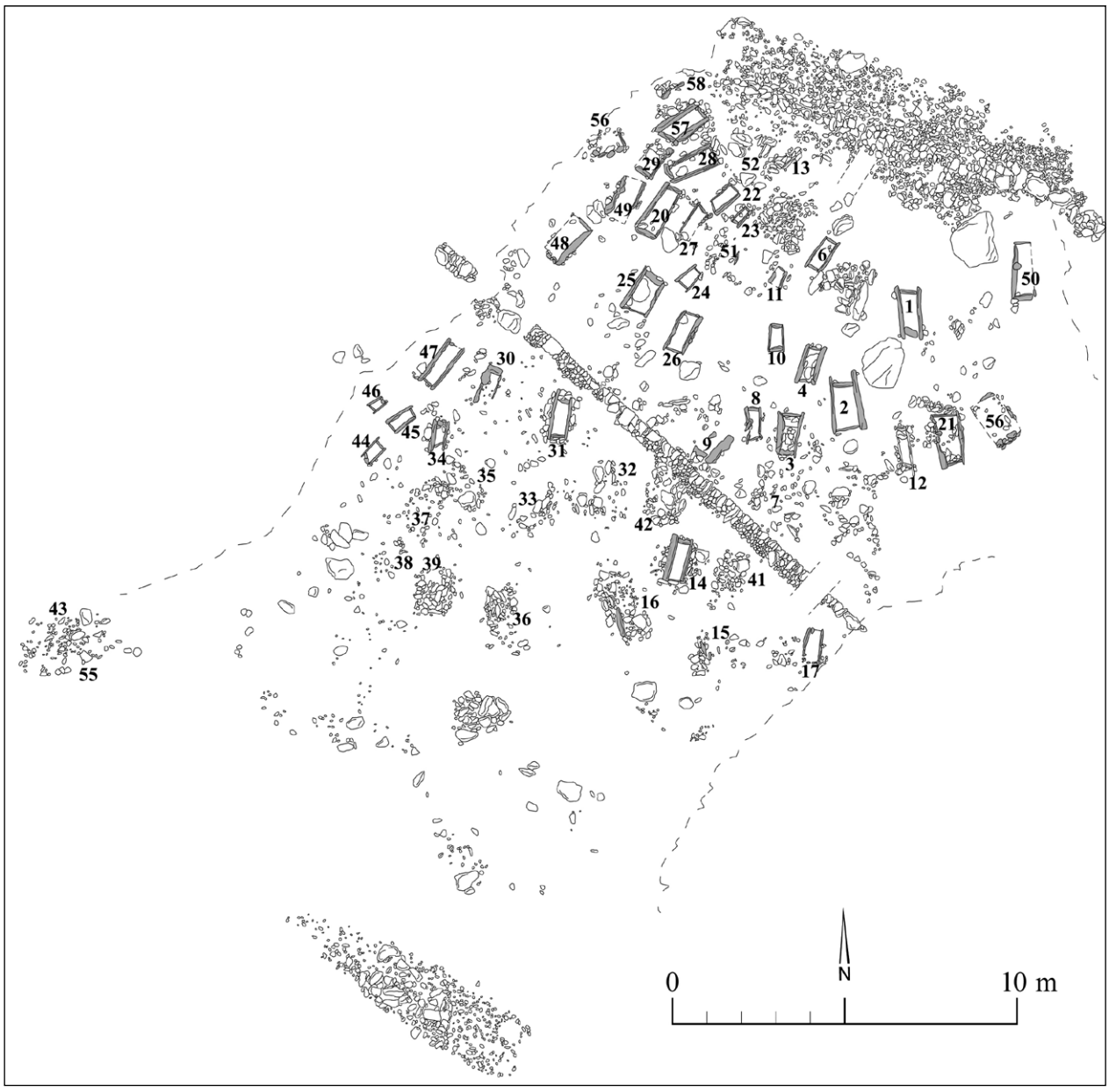


Figure 12: Quart, Vollein. Map of the site (source: N. Steuri after files from the Soprintendenza Aosta and by concession of the Autonomous Region of Valle d'Aosta).

(Giardino et al., 2005, 110). A capstone of usually larger circumference was placed on top of the formed cist (Fig. 13.1). The grave floor was sometimes partly paved with irregular stones (for example, as observed in graves T25 or T28). The graves were generally oriented in a northeast-southwest direction, and all the used stone slabs were made of local, relatively thin slate.

The dimensions of the individual stone cists vary. Generally, they were under 150 cm long and 80 cm wide. Graves with lateral lengths under 50 cm are interpreted as infant burials and often do not contain human remains (but this might be related to the poorer preservation of these more fragile bones).

Franco Mezzena notes that several stone cists were not constructed in specifically dug burial pits. The lateral stone slabs were positioned in shallow trenches and smaller stones were placed on the outer sides of the tombs for additional stabilisation (Mezzena, 1981, 18). This method of construction could have also contributed to keeping the stone cists more accessible for subsequent funerary activities (the stone

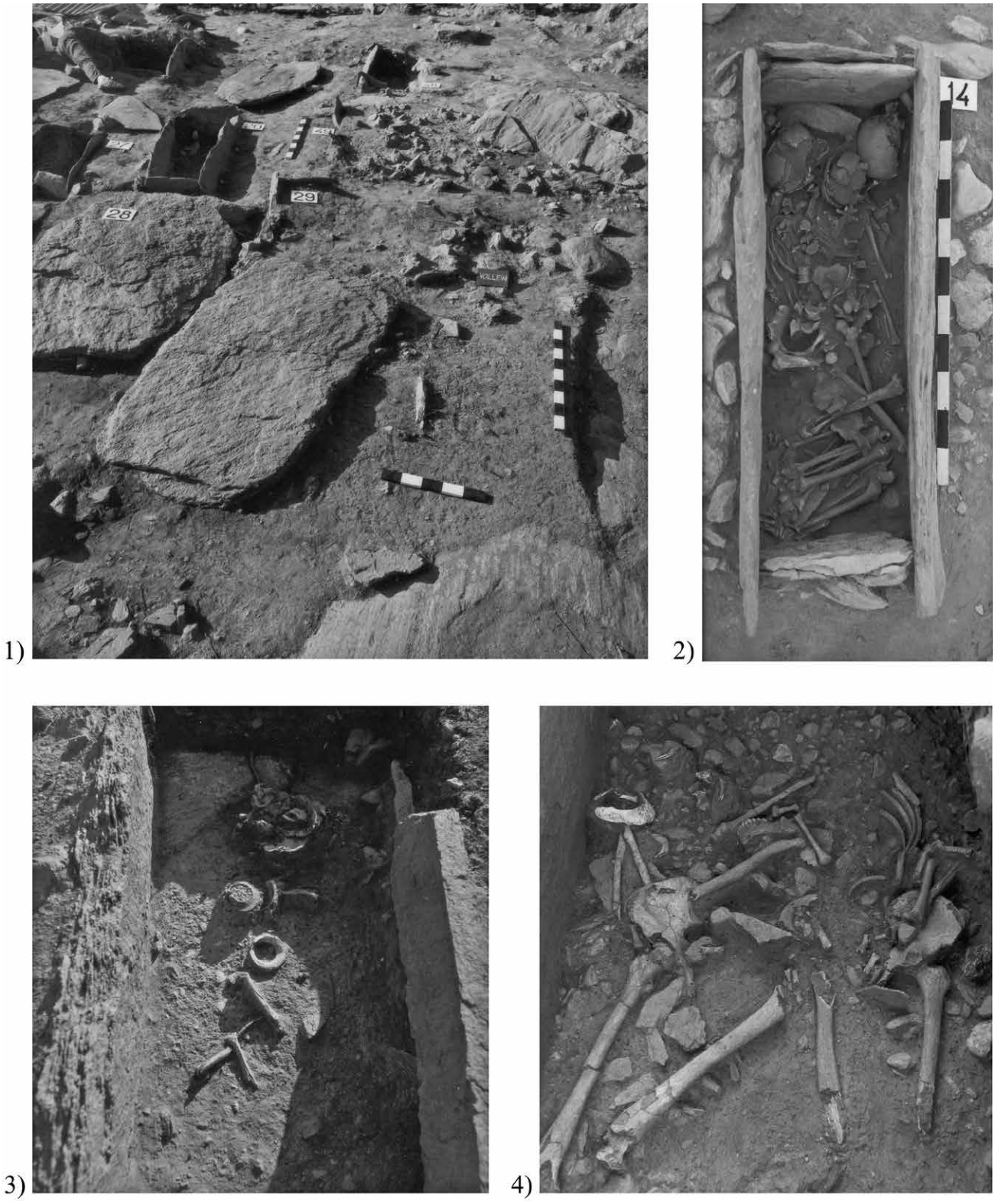


Figure 13: Quart, Vollein. Selected pictures: 1) view of stone cists with capstones, 2) top view of T14 with the remains of multiple individuals, 3) detailed view of T17 with a shell bracelet, 4) detailed view of T21 with comingled human remains and a shell bracelet (source: Soprintendenza Aosta and by concession of the Autonomous Region of Valle d'Aosta).

fragments on the outer sides of the lateral stone slabs could also originate from the backfill of the burial pit).

V. Burial practice

The bones recovered from the excavated stone cist graves were stored in the archive of the Soprintendenza di Aosta. They were untreated (i.e. still covered in sediment), which probably had a positive effect on their state of preservation. Therefore, no anthropological investigation had been carried out prior to this study. During the extraction of bone samples for radiocarbon dating in July 2020, the available human remains of the necropolis could be viewed by Dr. Marco Milella (Institute of Forensic Medicine, University of Bern). All available human remains from this site were cleaned in 2021, and an extensive anthropological evaluation of these human remains will be carried out starting in 2023.

Based on the documentation available in the archive of the Soprintendenza di Aosta (consisting mainly of photographs), the majority of individuals were turned onto their left side with contracted legs. The stretched supine position could also be registered, for example, in grave T50 (Fig. 14.3). The head was turned predominantly to the southern-southwestern area of the grave.

It can be assumed that a majority of the stone cist graves contained a single, primary burial. However, multiple burials were also detected; for example, double burials of two adult individuals (in T21, or T50), or of up to four individuals at grave T14.

According to Franco Mezzena, there was no clear evidence of secondary burial elements (Mezzena, 1982, 158). In some cases, displacement or mixing of bones was visible, suggesting an intention to move the human remains (for example, within graves T21, or T47).

In some sectors, a layer of ash and cremated bones was observed above the stone cist graves (Mezzena, 1981, 18). This layer is probably contemporary to the Bronze Age horizon(s) of the site and it is unclear if these features represent cremations.

VI. Grave goods

As with the human remains, no complete evaluation of the objects found within the stone cist graves had been carried out. There was only one mention of three large marine shells (Glycymeris) with a centred perforation by Franco Mezzena. These so-called seashell bracelets were found in graves T17, T21, and T31 (Figs. 13.3–4, 14.1, 15.1–3). There is some ambiguity regarding the origin of the last object. According to the literature, it was found in “tomba 30” (Arcà et al., 2014, 53; Mezzena, 1997, 53, 60). However, a shell bracelet can clearly be seen on a photograph of a stone cist grave labelled “T31”. Presumably, this is the same object, and, after discussion with colleagues of the Soprintendenza, the origin of this particular seashell bracelet was determined to be grave T31.

Owing to a review of the unpublished, stored material in the archive of the Soprintendenza, it is possible to give a brief but more complete account of the discovered grave goods: apart from said seashell bracelets, smaller seashell fragments of Glycymeris and Columbella were found within graves T40 and T55 (Fig. 15.4–5). Unique to the context of Neolithic cist graves in the western Alpine region, a perforated disc bead made of seashell (Fig. 15.6) was found in grave T33, of the same size as disc beads made of jet (6 mm in diameter and 2 mm in height). Fragments of rock crystals can be traced back to graves T2 (one fragment), T21 (two fragments), and T57 (two fragments). Several jet disc beads were found: 15 partially fragmented beads are labelled to be from T2, and an elongated, tube-shaped jet disc bead (8 mm in length) from T55 (Fig. 15.8–9). Unfortunately, the origin of 34 additional jet disc beads has yet to be determined. In addition, some small, ambiguous pottery fragments were collected from the filling of graves T21 and T26, and six calcinated bone fragments from grave T43. Finally, a small tube-shaped object (1.8 cm in length) from grave T14 was labelled to be made of seashell but appears to be made of animal bone. In total, possible grave goods were found within at least ten graves.

Of additional interest in this context are objects from the layers surrounding and on top of the stone cist graves (layers 2–7). Unfortunately, clear stratigraphic indica-

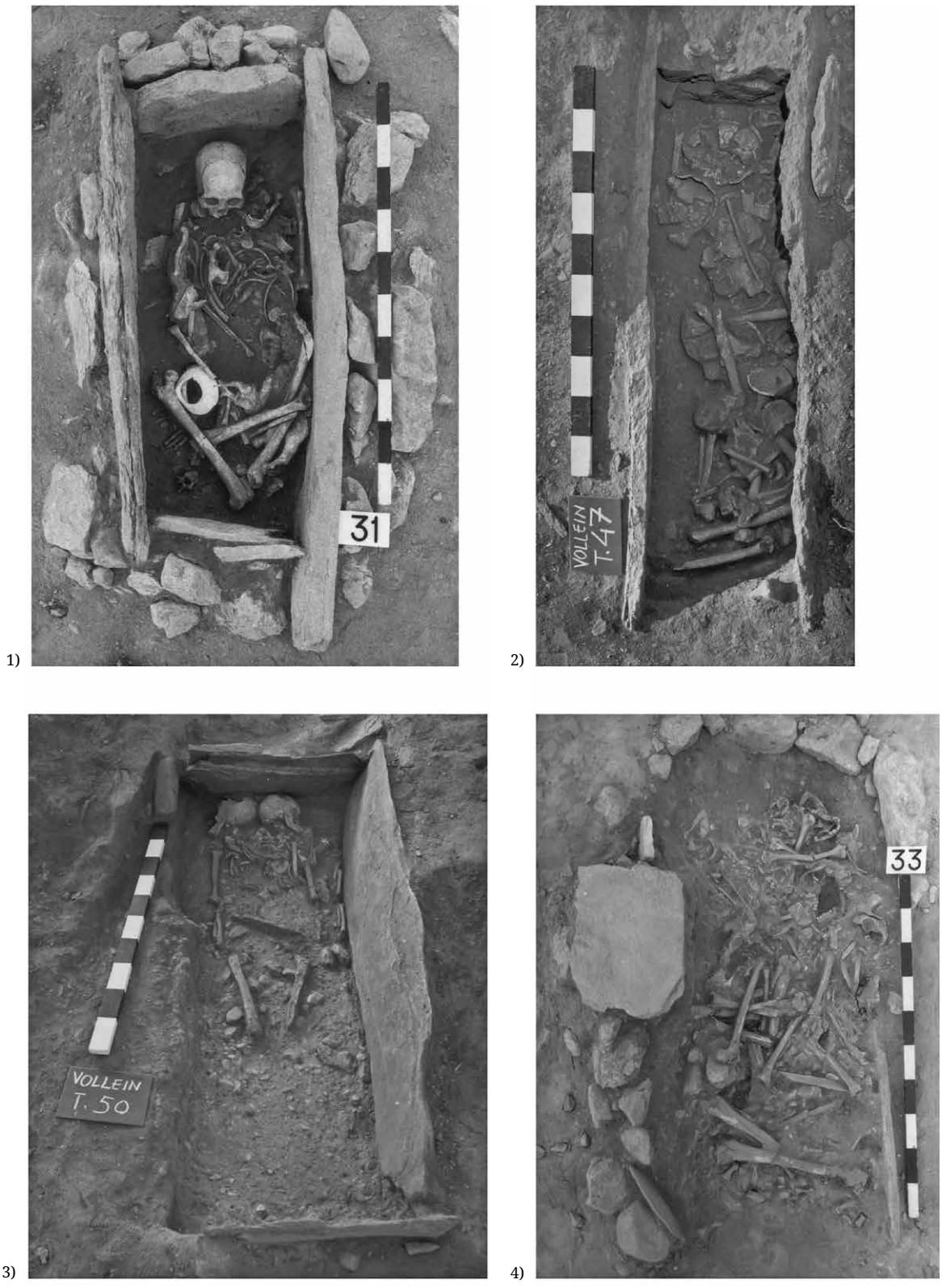


Figure 14: Quart, Vollein. Selected pictures: 1) view of T31 with a shell bracelet, 2) top view of T47 with comingled human remains, 3) top view of T50, 4) top view of T33 with comingled human remains (source: Soprintendenza Aosta and by concession of the Autonomous Region of Valle d'Aosta).

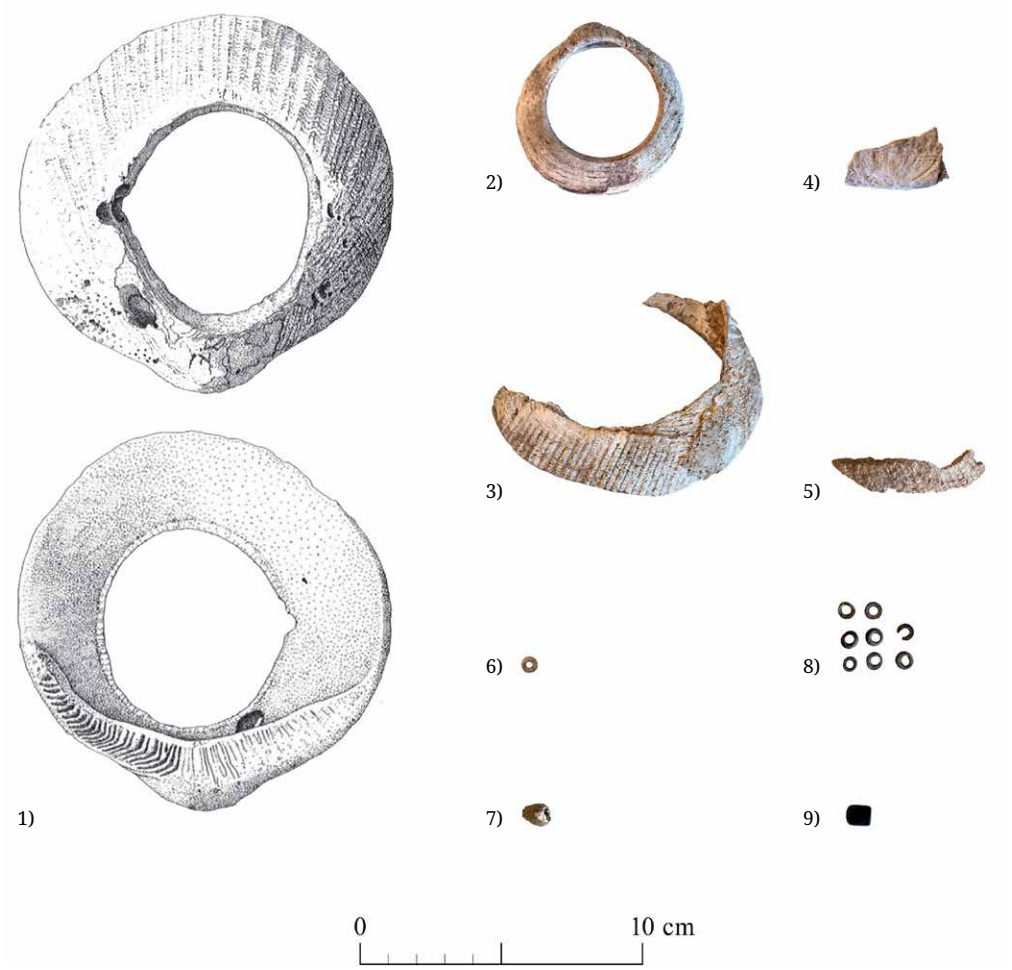


Figure 15: Quart, Vollein. Grave goods: 1) shell bracelet from T31 (source: Mezzena 1997), 2) shell bracelet from T17, 3) shell bracelet from T21, 4) shell fragment from T40, 5) shell fragment from T55, 6) shell disc bead from T33, 7) shell bead from T55, 8) jet disc beads from T2, 9) tubular jet bead from T55.

tions of the published objects are mostly missing; therefore, the finds are presented only in summary.

- Pottery: Three small pottery fragments originate from vessels with square mouths (Mezzena, 1997, 53, 56), a typical element of the Neolithic vasi a bocca quadrata (VBQ) ceramic type. The selection of the other published fine pottery sherds suggests mainly bulbous or conical vessels with protruding rims and lugs, or handles. Typical decorative elements are vertical, clustered grooves, or "flutes" (individual sherds also show curved fluting), notched lines, and punctures. The published coarse pottery sherds mostly show bands with fingerprint impressions (Mezzena, 1997, 53–60). Franco Mezzena typologically dates these pottery fragments to the Middle Bronze, around 1600 BCE (Giardino et al., 2005, 110). A slightly younger age appears likely, however; for example, the published ceramic finds from the prehistoric hilltop settlement of Zeneggen, Kasteltschunggen (Valais, Switzerland), show distinct parallels, and the site is connected to Aosta (some 70 km to the south) via the Theodul pass (David Elbiali, 1994, 45–51). The pottery from this site is typical of the Middle to Early Late Bronze Age (Bz C/D), and two 14C samples date between 1500 and 1250 BCE (David Elbiali, 1998, 393).
- Stone tools: Flint is generally rare within the sites located in the Aosta Valley, however, some five arrowheads, two blades, and a trapezoidal tool were found "between the graves" (Mezzena, 1997, 44, 54). In addition, 11 quartz objects were found, among others consisting of possible arrowheads, trapezoidal scrapers, and pointed awls (Mezzena, 1997, 55). Two polished stone objects were also mentioned; one fragment appears to be shaped to a point and the other is a triangular pendant of light green

colouration (jadeite?). The latter is perforated, about 3 cm long, and resembles an axe blade (Mezzena, 1982, 167).

- Other types of finds: Franco Mezzena mentions small shell pendants (Columbella rustica and Dentalium) and objects made of bronze and/or copper (rings, awls, and arrowheads) originating from the upper layers above the stone cist graves (Mezzena, 1997, 60, 1982, 166).

4.1.2. Villeneuve, Champ Rotard

I. Context

The site, consisting of at least 33 stone cist graves, is located in the municipality of Villeneuve (approximately 11 km west of the city of Aosta), on the "Champ Rotard" meadow, an alluvial terrace approximately 300 m south of the current course of the Dora Bàltea River. The graves were discovered east of the hydroelectric power plant "Centrale Idroelettrica Champagne 1" at an altitude of about 678 m.

II. Background

During construction work of the hydroelectric power plant in October 1917, some stone cists were discovered. Ernesto Schiaparelli, professor of Egyptology at the University of Turin, recognised similarities between these graves and graves from the site of Montjovet, which were excavated in 1909. At his instigation, the area was examined by the Soprintendenza under the direction of Piero Barocelli. During the excavation campaign, a total of 25 stone cists were found (named T1 to T25). Unfortunately, some graves (T1, T3, T4, and T5) had already been partially destroyed by construction work. No stone cists were found in the southern and southwestern part of the excavated area, and Piero Barocelli assumed that the necropolis extended in the northern and eastern direction (Giardino et al., 2005, 110).

During minor renovation work in front of the eastern façade of the hydroelectric plant, two stone slabs were discovered in June 1987. Thus, from July to August 1987, another area (around 18 m by 6 m) was investigated by Franco Mezzena. In the northwestern zone of this excavation, some graves already found in 1917 could be rediscovered. Moreover, in the northern half of the excavated area, eight additional stone cist graves (named T26 to T33) were found (Fig. 16).

Some archaeological features (in Layer 3) were documented and are assumed to relate to these graves: they consist of a circular arrangement of postholes around T33, accumulations of charcoal and calcined bone fragments around some capstones, and a hearth. In addition, two capstones (of graves T31 and T32) showed circular perforations, a unique feature of stone cist graves found within all assessed sites. However, in megalithic dolmens graves, wall slabs with perforations, so-called port holes (French "hublot"), are more common. It might be that the purpose of these perforations in the capstones was to allow for the interspersing of additional human remains or grave goods.

Based on the distribution of the graves, it can be assumed that they actually extend further in the northern and eastern directions. The entire necropolis can be estimated to contain around 50 graves. Since the stone cists were discovered at a depth of about 1 m, further research in the form of a geophysical prospection could provide important clues about the true extent of this necropolis.

Stratigraphy: According to Piero Barocelli, the capstones of the graves from 1917 were found at a depth of around 120 cm (Barocelli, 1951, 203). More information is available on the graves discovered in 1987, which were excavated in a largely undisturbed context. Based on the published data of Franco Mezzena (Mezzena, 1997, 22–26), the stratigraphic sequence of the site can be summarised as follows (from bottom to top):

- Layer 1, fine, light green sand, found below the stone cists: Franco Mezzena assumed that the upper part of Layer 1 represents the Neolithic ground level and was the starting point for the construction of the graves.

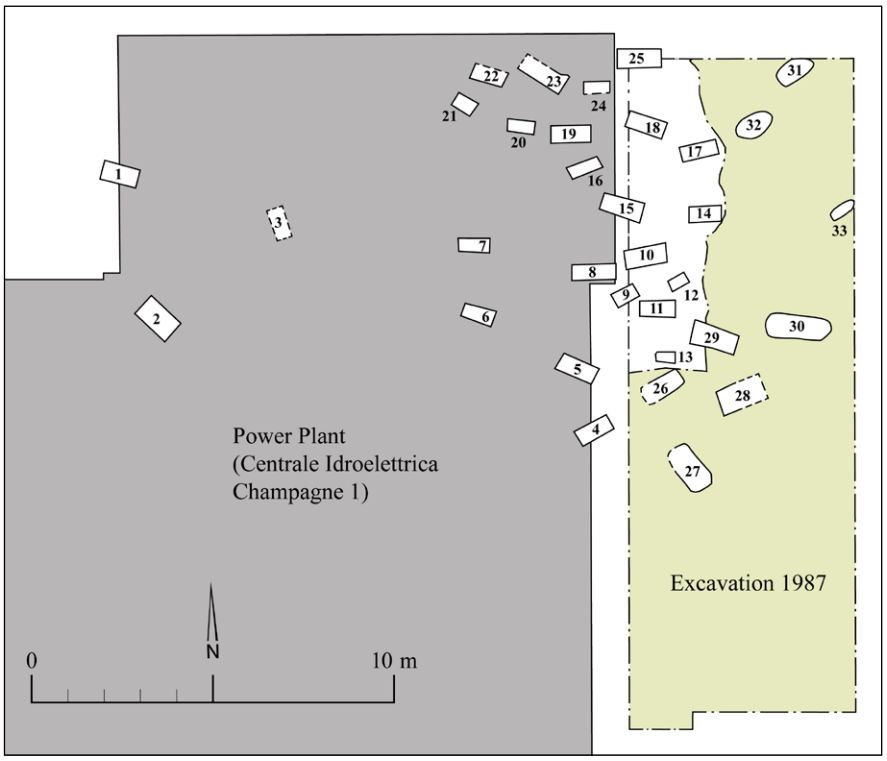


Figure 16: Villeneuve, Champ Rotard. Map of the site (source: N. Steuri after Mezzena 1997).

- Layer 2, coarse, grey sand with occasional pebbles of green-to-yellow colour: Franco Mezzena describes it as an alluvial material. The layer extends to about the level of the capstones of the graves. Assuming the stone cists were constructed in pits, the upper part of Layer 2 could reflect the Neolithic ground level.
- Layer 3, light brown silt covering the top of the capstones of the graves: In the lower area, the layer is darker in colour, with some larger gravel (Layer 3a). Above, there is only isolated fine-grained gravel (Layer 3b).
- Layer 4, greenish-grey silt with fine-grained, homogeneous gravel: This layer contained almost no archaeological finds and is probably younger than the necropolis (Bronze to Iron Age).
- Layers 5 and 6, heterogeneous, displaced material, probably originating from the construction of the power plant in 1917.

III. Spatial organisation of the necropolis

The majority of stone cists were constructed with four lateral stone slabs and a horizontal capstone of local slate (Fig. 17.1–2). The orientation of the graves varied from northeast to southeast. According to Piero Barocelli, the stone cists were under 140 cm long and about 50 cm wide, and the grave floor was formed by sand (probably Layer 1, as described by Franco Mezzena; Barocelli, 1919, 253–254).

IV. Individual grave description

Based on the limited data available from the excavation campaigns, it is not possible to give an account of the individual graves at this site.

V. Burial practice

Evaluation of the human remains: According to Savina Fumagalli, the bones of the 1917 graves were relocated several times. During her anthropological study in 1955, some 15 wooden boxes containing human remains from Villeneuve, Champ Rotard, were found in the Aosa Museum. For example, a total of 18 skulls were recovered during

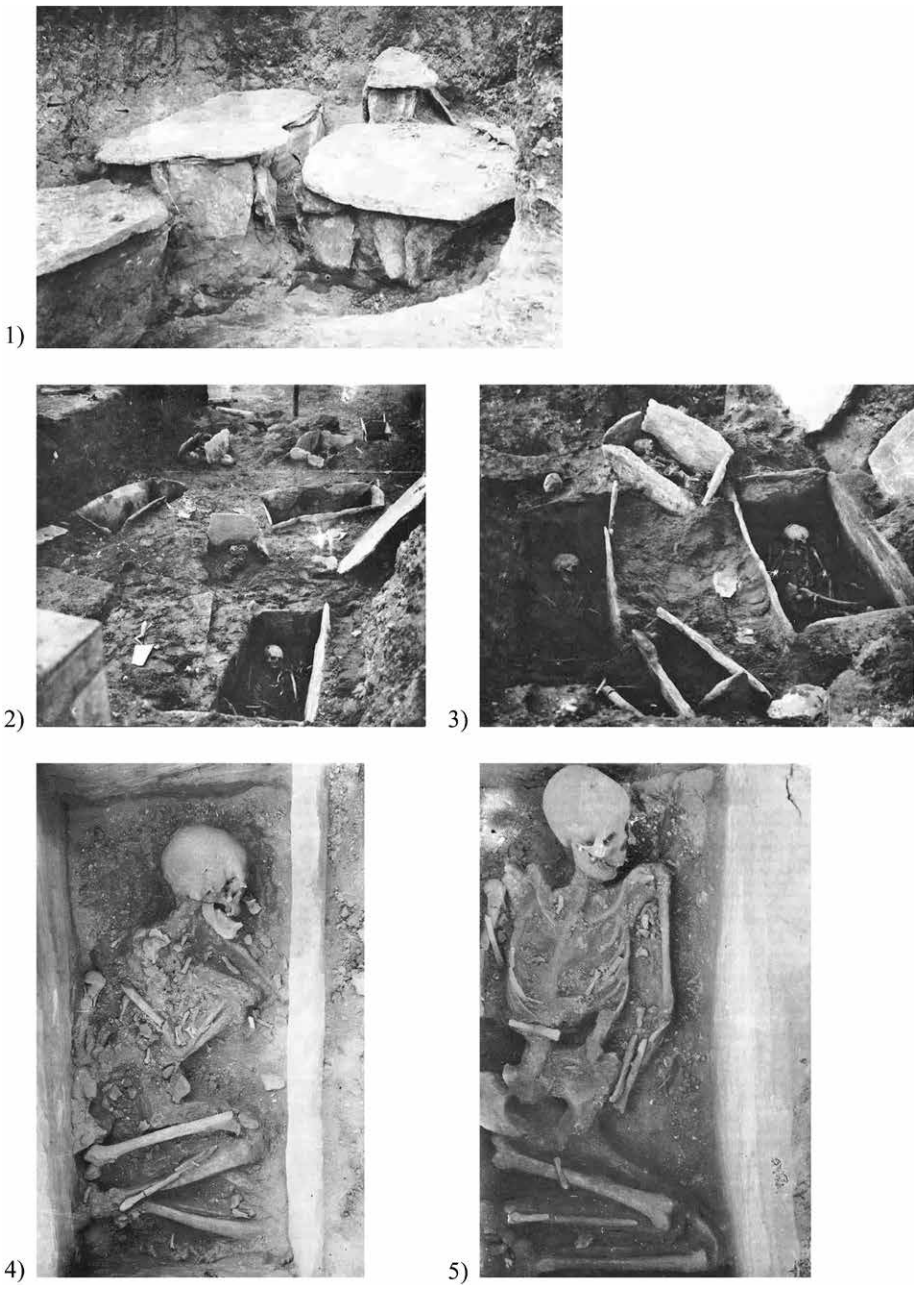


Figure 17: Villeneuve, Champ Rotard. Selected pictures: 1) view of stone cists with capstones, 2) view of T20 to T25, 3) view of T9 to T12, 4) top view of T7, 5) top view of T8 (source: © Corrain 1986).

the 1917 excavation. By 1955, only nine could be located and subsequently analysed by Fumagalli (Fumagalli, 1955, 105–144).

A more comprehensive anthropological study of the 1917 human remains (graves T1–25) was published in 1986 by Cleto Corrain (Istituto di Antropologia of the University of Padua; Corrain, 1986). The results of his age and sex determinations are listed in Table 3. In this study, the photographic documentation of the 1917 excavation was also published. Of particular importance are the images of 13 stone cist graves, which allow us to make inferences about the placement of the individuals inside the graves. Unfortunately, no information regarding the human remains from the 1987 graves (T26–T33) is available.

Placement of the individuals: The photographs show the skeletons placed predominantly in anatomical connection (Figs. 17 and 18). The individuals were generally placed on the left side of the body. In some cases, the upper body was in the supine position (presumably at T8, T18, and T25). The knees were bent to the left side and the legs were

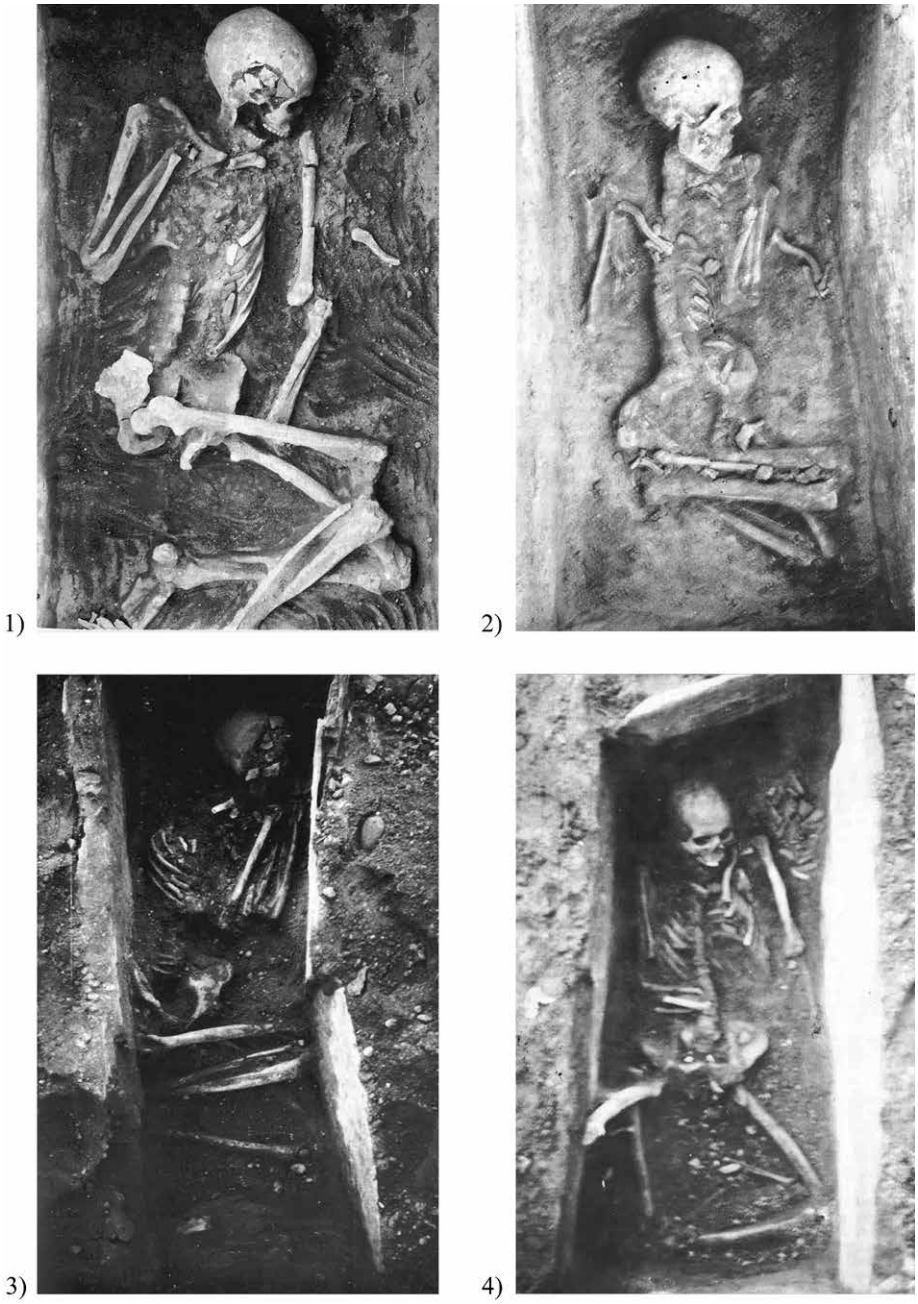


Figure 18: Villeneuve, Champ Rotard. Selected pictures: 1) top view of T10, 2) top view of T11, 3) top view of T17, 4) top view of T25 (source: © Corrain 1986).

contracted, with knees well below the pelvic level (T14 and T18) to knees at chest level (T6). The positioning of the arms varied but were probably mostly folded in front of the chest. The head was laid in the western part of the stone cist, facing north.

Based on the information available, these graves contain mostly single burials of adult individuals. Exceptions are three single graves with remains of subadults (T12, T13, and T20; Barocelli, 1919, 256) and T16, containing two individuals (one adult and one approximate 8-year-old child; Fumagalli, 1955, 122).

Piero Barocelli suspected occasional secondary burial elements, as ribs and vertebrae were displaced in some graves and the smaller hand and foot bones were often missing. Additionally, some teeth were found displaced from the skull in graves T11 and T15, and cist T21 only contained leg bones (Barocelli, 1919, 254). An assessment of these claims is generally difficult to make, due to the lack of detailed plans, photos, or modern excavation techniques. Nevertheless, it can be assumed that the burial practice within the

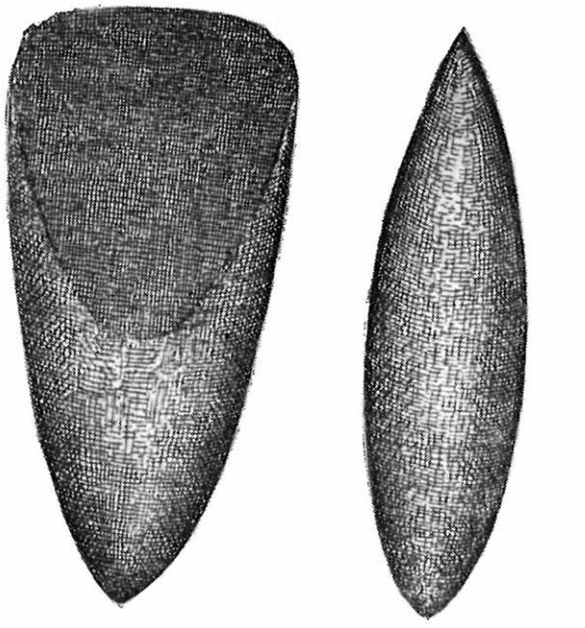


Figure 19: Villeneuve, Champ Rotard. Stone axe blade from T19, unknown scale (source: Barocelli 1951).

stone cist graves of the Villeneuve site can be summarised as almost exclusively primary burials of single, adult individuals.

VI. Grave goods

The 1917 graves contained few finds, consisting of a greenstone axe blade (Fig. 19), a flint tool (drill), and a quartz object, all found within grave T19. Additionally, T25 contained a small, perforated bore tooth, and within grave T8, some bird bones were noted (Barocelli, 1919, 256).

No grave goods were found in the 1987 stone cists, but a number of objects were published from Layer 3. Based on the stratigraphy, these should be placed chronologically after the use of the stone cist graves, as Layer 3 is above the capstones. One charcoal sample from a presumed fireplace dating to 2285–1750 cal. BCE supports this assumption (although Franco Mezzena assumes this dating to be too young; Mezzena, 1997, 29–34).

Pottery: Only small fragments were found, therefore, the orientation of the sherds in the published drawing (Mezzena, 1997, 31–33) must be interpreted with caution. At least four fragments show incised decorations of different patterns, and one further sherd has a horizontal band with fingernail impressions. Together, they are reminiscent of the facies of Saint-Léonard, Sur-le-Grand-Pré, from the 4th millennium BCE (Winiger, 1995).

Stone tools: These mainly consist of an axe blade and an oval to rhombic-shaped object of polished greenstone. The latter was addressed by Franco Mezzena as a lance. At Dolmen MXII of Sion, Petit-Chasseur, numerous similar objects were also found, dating to the first half of the 3rd millennium BCE (Favre and Mottet, 2011, 65). The flint objects consist of smaller blades, scrapers, and drills. Numerous quartz pieces also show signs of reworking (blades, scrapers, and drills).

Ornamental elements: According to Franco Mezzena, Layer 3 contained various shell objects (from Columbella rustica and Dentalium), but these were neither illustrated nor described in more detail (Mezzena, 1997, 26). Furthermore, an elongated, pointed copper object (possibly a needle fragment) and a flat jade disc with a central, round perforation were mentioned.

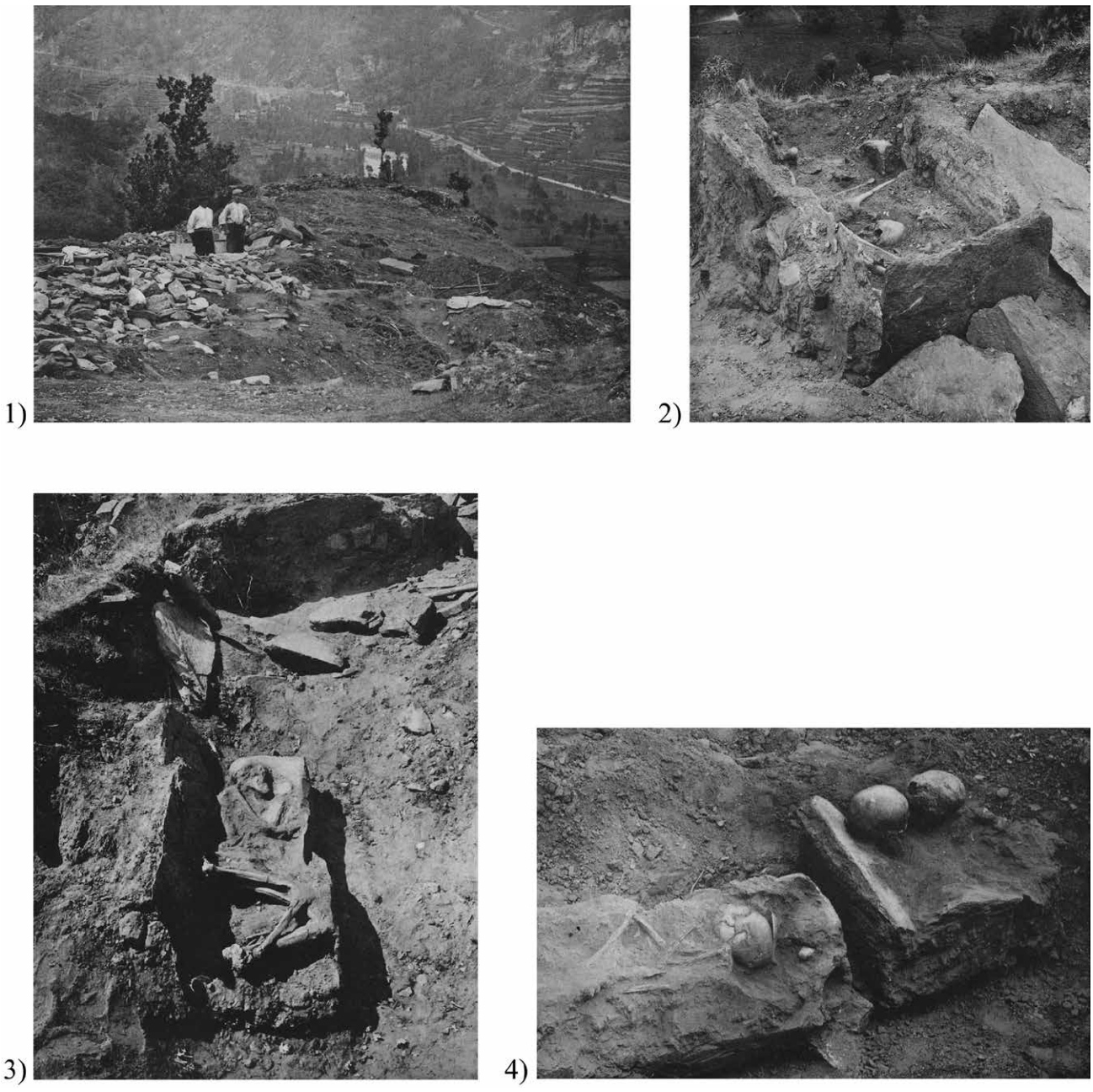


Figure 20: Montjovet, Fiusey. Selected pictures: 1) view of the excavation, 2) side view of Sep. V, 3) top view of Sep. I, 4) side view of Sep. III and Sep. IV (source: Rizzo 1910).

4.1.3. Montjovet, Fiusey

I. Context

The site consisting of five stone cist graves is located on a hill plateau, about "half an hour" above the Fiusey meadow (sometimes written "Finsey"), west of the village of Méran. The latter is located on the western bank of the Dora Bàltea River and is part of the municipality of Montjovet. The plateau (at an altitude of 417 m) is a few hundred square metres in size and is delimited by steep slopes towards the valley of the river.

II. Background

In June 1909, a farmer discovered rectangular stone structures while levelling an area on the hill plateau for a planned vineyard. Informed by a local cleric, Egyptologist Prof.

Ernesto Schiaparelli immediately went to the site on behalf of the Soprintendenza of Piedmont (Turin). Under his direction, the short but methodical excavation began in July 1909 (Fig. 20.1).

The graves were discovered just below the modern surface and consisted of stone slabs that had already been disturbed by ploughing. Each grave contained a single individual in an elongated supine position with the head facing east. The few grave goods and stray finds indicate a repeated use period from Late Antiquity to Early Medieval (Rizzo, 1910, 835).

Directly beneath these graves, closely grouped stone cists were uncovered at about 40 cm below the surface (just above the natural rock of the hill; Barocelli, 1951, 202). Ernesto Schiaparelli suspected these to be the first Neolithic burials discovered in the Aosta Valley. Therefore, it was decided to block-extract these five graves and transport them to the Museum of Turin and to exhibit them in the Hall of Prehistoric Antiquities of Piedmont. But during the Second World War, these human remains were heavily disturbed and three of the five graves were destroyed (Fumagalli, 1955, 109). According to Arcà et al., 2014, 51, the two remaining burials were stored in archives of the Soprintendenza of Piedmont. In the context of this research project, one grave (Sep. I) was rediscovered in the archive of the Musei Reali in Turin in March 2022.

III. Spatial organisation of the necropolis

The graves were found grouped together; more information regarding the spatial organisation is not available. However, according to Franco Mezzena, traces of Neolithic settlement/occupation were discovered south of the stone cist graves (Mezzena, 1981, 22).

In order to highlight the different grave architectures and burial practices, the graves of this particular site will be outlined separately (based on the published data by Rizzo, 1910).

IV. Individual grave description

Grave Sep. I

- Grave architecture: Rectangular cist formed by six lateral stone slabs (the long sides consisting of two stones each) and two capstones. The stone cist measured 137 cm by 48 cm and was most probably oriented north to south.
- Human remains: The relatively well-preserved skeleton of a single individual was found inside the grave. According to the report by anthropologist Prof. M. Carrara (University of Turin), the skeleton was complete. The pelvis was in the frontal position and the spine was in the lateral position (Rizzo, 1910, 840). The legs were slightly bent (knees on the level of the pelvis) and the hands were in front of the face. The skull was oriented north (Fig. 20.3).

Grave Sep. II

- Grave architecture: Rectangular cist of similar build as Sep. I, but one of the long sides consisted of a single lateral slab, while the opposite one was formed by three smaller stones. A capstone was found above the six lateral stone slabs. The stone cist measured 90 cm by 40 cm.
- Human remains: Only the skull of an adult individual (probably female) was found inside the stone cist, supposedly placed on a small stone slab on the grave floor.

Grave Sep. III

- Grave architecture: No stones could be found. Furrows in the sediment were documented, probably originating from missing lateral stone slabs. These presumed foundation trenches indicate the grave's dimensions to have been approximately 100 cm by 40 cm.
- Human remains: The poorly preserved bones of at least one individual were found commingled inside the stone cist.

Grave Sep. IV
- Grave architecture: Only two stone slabs were found from the presumed stone cist. Similar to Sep. III, the former dimensions could be reconstructed on the basis of presumed foundation trenches of the missing side slabs (78 cm by 68 cm).
- Human remains: Only two skulls were found, placed side by side on a stone slab on the grave floor.

Grave Sep. V
- Grave architecture: Rectangular stone cist of similar shape as Sep. I, measuring 146 cm by 60 cm. Several capstones were still in place on top of the lateral stone slabs.
- Human remains: The commingled bones of at least three individuals were found inside the grave. It was assumed that the individuals were originally placed on top of each other (Fig. 20.2).

V. Burial practice
Early on, Giulio Rizzo suspected that these human remains showed some secondary burial elements (Rizzo, 1910, 836–837). On the basis of the findings, skull depositions can be assumed in Sep. II and Sep. IV (Fig. 20.4), especially regarding Sep. II, where the capstone was still in place, rendering later disturbances unlikely. Additionally, the bones from graves Sep. III and V were commingled and no longer in anatomical connection, indicating that the human remains were deposited in the stone cist after decomposition (however, later disturbances cannot be excluded). Based on the available data, only the individual in Sep. I can clearly be classified as a primary burial.

VI. Grave goods
No objects were documented in any of the graves. Ernesto Schiaparelli solely mentioned two small glass fragments originating from the backfill of Sep. V. Giulio Rizzo already indicated that these originate from the younger, overlying graves and probably entered the sediment of Sep. V through a gap between the capstones. A worked flint blade of yellowish colour was discovered next to Sep. III, and some small fragments of grey-toned coarse pottery with quartz temper were found surrounding the graves (Rizzo, 1910, 834–835).

4.1.4 Outlined sites

La Salle, Derby
Overview: The site is located in the municipality of La Salle in the western Aosta Valley (about 20 km southeast of Mont Blanc). During construction work for a well in the district of Derby, an isolated stone cist was discovered in 1952. It consisted of four lateral slate stone slabs and a large horizontal capstone. It was 165 cm long and 109 cm wide.

The bones of three individuals (an adult male, an adult female, and a child) were found inside the stone cist (Fig. 21). The presumably male skull was placed on a small rectangular slate plate with a flint chip next to it (Fumagalli, 1955, 110–112). As part of this research project, the human remains from Derby were rediscovered in the archive of the Soprintendenza di Aosta. After a brief anthropological examination, Dr. Marco Milella (Institute of Forensic Medicine of the University of Bern) was able to determine that these were the remains of at least three burials: Indiv. 1 (male, 35–49 years old), Indiv. 2 (female, 20–34 years old), and Indiv. 3 (approx. 3-year-old child).

Saint-Nicolas
Overview: The church of the municipality of Saint-Nicolas is situated on a plateau at about 1200 m above sea level, around 15 km west of the city of Aosta. In 1869, during agricultural work, a grave was discovered east of the church, next to the steep slope above

Figure 21: La Salle, Derby. Top view of the stone cist and human remains (source: Soprintendenza Aosta and by concession of the Autonomous Region of Valle d'Aosta).

the Dora Bàltea River. According to Eduard Bérard, it consisted of four lateral slate slabs and a horizontal capstone, forming a rectangular cist. No information on the dimensions of the grave or human remains is available. Only a perforated seashell was mentioned (Bérard, 1887, 131).

A few years later, a second grave was discovered, but at the time of inspection by Bérard, it had already been disturbed. He could only examine the slate slabs and estimate that it was north-south oriented. Initially, only one seashell was found. At a later time, an antiquarian showed Bérard two seashell fragments supposedly also coming from this grave (Fig. 22). These segments are crescent-shaped and each has two perforations on the narrow sides (making an interpretation as a bracelet probable, Bérard, 1887, 131). Today, these objects are stored in the Académie Saint-Anselme in Aosta (Barocelli, 1951, 200).

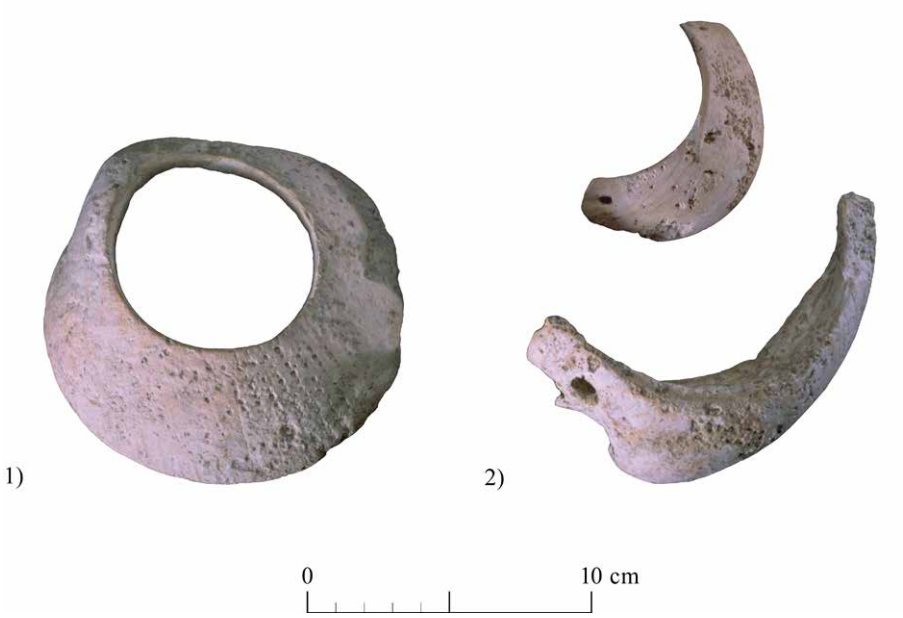


Figure 22: Saint-Nicolas. Grave goods: 1) a shell bracelet from the first grave, 2) two fragments of a shell bracelet from the second grave.

Based on the limited information available, a classification of these graves as stone cists is likely, especially since the grave goods most likely date to the Neolithic, as suggested by Luigi Pigorini (Pigorini, 1888, 114).

Sarre

Overview: The site was located on a field in the village of Sarre, about 5 km west of the city of Aosta, on the north bank of the Dora Bàltea River. The exact location is unclear. P. Frassy states that it is located around 20 minutes north of the road, not far from the church (Frassy, 1889, 392). According to André Zanotto, this information is probably false, since the church is not 20 minutes away from the main road (Zanotto, 1986, 410). In fact, it is located barely 200 m northeast of the current national road.

In 1889, during earthworks for a vineyard, three graves (T1–3) were discovered. They were constructed of stone slabs and north-south oriented. In addition, two other graves, containing only a few bone fragments, were found more towards the south (T4–5). According to one worker, there were no capstones present, and the graves were filled with soil. Regarding grave goods, only two perforated seashells were mentioned. Both were found within one of the northern graves (T1, T2, or T3).

Apparently, the bottom of the lateral stone slabs of grave T2 was embedded in some type of mortar that also covered the grave floor. At a depth of about 30 cm, Frassy found a mortar bed west of T2, which was not very compact and strongly weathered ("crumbled easily"). It was around 30 cm thick. Lime mortar was also found by graves T1 and 3 (Frassy, 1889, 392–393). On the basis of the limited information available, a chronological classification of the graves of Sarre is difficult, especially because of the mentioned mortar.

Quart, Effraz

Overview: The site is located near the village of Effraz (Efraz), in the municipality of Quart (only a few kilometres from the necropolis of Vollein). The farmer Mr. Brunet reported that he found a stone cist grave while ploughing his field (called "Tsan-di-piì") in 1959. A similar discovery was reported by the Bétemps brothers in 1963 in the neighbouring field at a distance of about 20–25 m. The site was then visited by Rosanna Mollo of the Soprintendenza di Aosta in 1968.

According to Brunet, the grave he discovered was identical to the stone cists of the Vollein necropolis and contained two skulls. Of the total of three graves in the field of the Bétemps brothers, some lateral stone slabs were still present. Apparently, two skulls and some long bones were found in one of them (Daudry, 1969, 222, 226).

An archaeological investigation of the site has not yet been carried out. Due to the distance between the discovered stone cists, it could either represent two burial groups or an extensive necropolis (similar to Vollein).

Nus, Fognier

Overview: During the construction of a garage in 1967, two stone cist graves were found in Fognier, a village in the municipality of Nus (about 15 km east of the city of Aosta). Apparently, the stone slabs were incorporated into the garage wall, and the discovered bones were disposed of in a pit. No further information is available, as the Soprintendenza di Aosta was not informed of these until March 16, 1968 (Daudry, 1969, 222).

Saint-Vincent

Overview: Apparently, three stone cist graves were discovered and destroyed during the extension of the Piccola Casa della Divina Provvidenza hospital north of the municipality of Saint-Vincent (Daudry, 1969, 226).

Saint-Denis, Ploi

Overview: Damien Daudry received the note of a grave discovery in the meadow of "Ploi" in the municipality of Saint-Denis. During his visit to the site, he found the remains of a grave made of stone slabs, showing similarities to the stone cist graves from Vollein (Daudry, 1974, 206).

4.2. Tarentaise Valley

The research focus in this zone was on the necropolis of Aime, Le Replat (Chapter 4.2.1), the grave group(s) of Bourg-Saint-Maurice, Le Châtelard (Chapter 4.2.2), and the outlined site of Bellecombe, Torrent du Morel (Chapter 4.2.3) (for the location of sites, see Fig. 1).

4.2.1. Aime, Le Replat

I. Context

The site consists of up to 30 stone cist graves and is located north of the Isère River in the municipality of Aime-La Plagne (Savoie department) in the Tarentaise Valley. Only about 15 km northeast of this necropolis (itself at a height of 656 m) is the eastern access to the Little St. Bernard Alpine pass, which is the direct connection to the Aosta Valley.

II. Background

During construction work near the meadow "Le Replat", two stone cist graves (Tombes 1 and 2) were discovered in June 1985. Tombe 1 was excavated, while only a small section of Tombe 2 was uncovered. Subsequently, the Direction des Antiquités Préhistoriques and the Société d'Archéologie d'Aime initiated the archaeological investigation of a long, narrow ditch about 60 m south of Tombe 1 from December 1985 to March 1986. During this work, four stone cists (Tombes 3–6) were excavated, and stone slabs of at least three additional graves (Tombes 7–9) were discovered in the southern profile of the ditch. The latter stone cists, which lie beneath the ballast of the railroad tracks running approximately 30 m to the southeast, could not be further excavated. In addition, an area of roughly 4000 m^2 was "electronically prospected", and the (presumed) capstones of numerous other graves were located (Gély et al., 1991, 41) (Fig. 23).

Frédérique Valentin was able to examine the bones of seven individuals: six adults and one juvenile, who was around 15 years old. Anthropological sex determination was possible for four adult individuals and resulted in the identification of two males and two females. The body height of the males was estimated to be 165 cm and that of females

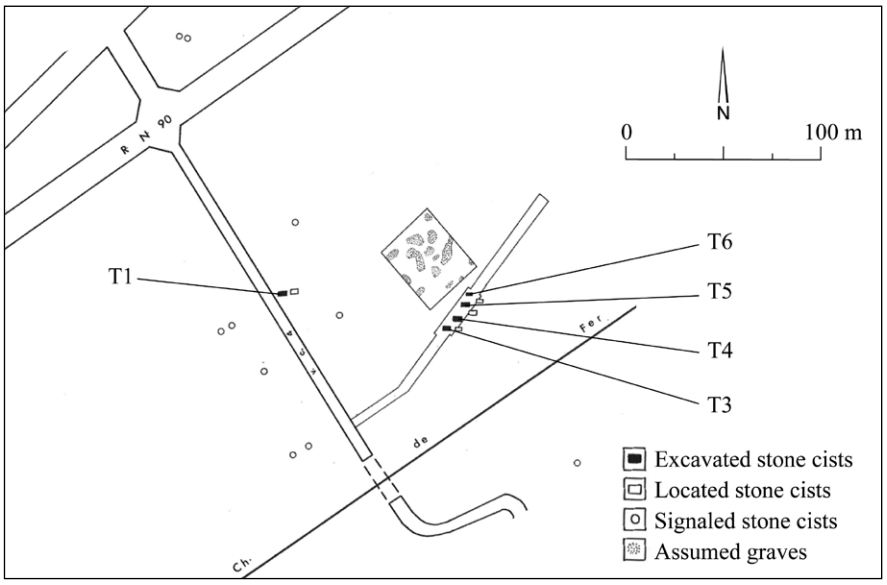


Figure 23: Aime, Le Replat. Map of the site (source: N. Steuri after © Gély et al. 1991).

to be 158 cm. Unfortunately, this report lacks information on individual or grave numbers (Valentin, 1992).

III. Spatial organisation of the necropolis

A total of nine stone cist graves were fully or partially uncovered, and at least 20 others were determined, indicating a total area of the necropolis of over 4000 m², with dozens of graves. The excavated features indicate that the stone cists were arranged regularly, at intervals of only about 1 m and in a strictly east-west direction. Based on the stratigraphy, the capstones were probably not covered initially and thus superficially accessible (Gély et al., 1991, 41).

The construction of the stone cists corresponds to that of other covered sites: first, the lateral stone slabs of the narrow sides were placed in a pit about 1 m deep. These slightly trapezoidal worked stone plates were anchored in grooves up to 20 cm deep on the bottom of the burial pit. It is likely that the grave floor was additionally levelled with a layer of gravel. Following that, the longer lateral side slabs were placed, overhanging the narrow sides by 5–30 cm. The formed stone cist was closed horizontally by an oversized capstone (Gély et al., 1991, 46). The similarity of the individual graves and the absence of overlaps between stone cists could indicate that the necropolis was used for a shorter period of time, as no superficial grave markings could be observed (Gély, 2005, 186).

IV. Individual grave description

The following is a summary of the available information on the five excavated stone cist graves (Tombes 1, 3–6), mainly based on the published short report by Gély et al., 1991.

Grave Tombe 1

- Grave architecture: Rectangular stone cist, formed by four lateral stone slabs with a length of about 125 cm and width of 65 cm. A 217 cm-long capstone was placed on top, overhanging the lateral slabs by 30–40 cm.
- Human remains: The grave contained the primary burial of a 40- to 60-year-old female in a supine position with the skull in the eastern area of the grave and facing south. The lower limbs were slightly flexed (knees below pelvic level, feet below pelvis) and angled to the left side of the body. The right hand was resting on the right hip (Fig. 24).
- Grave goods: A small bone awl was found under the right femur (Fig. 25.1).

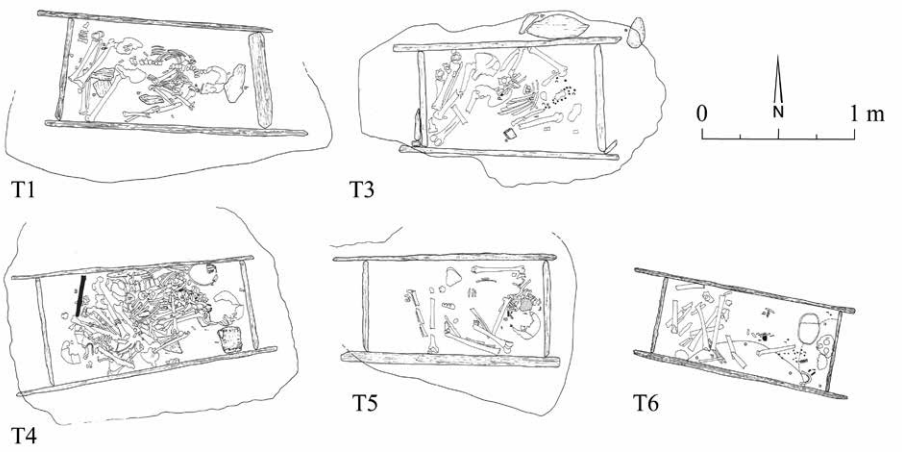


Figure 24: Aime, Le Replat. Drawings of the excavated stone cist graves (© Gély et al. 1991).

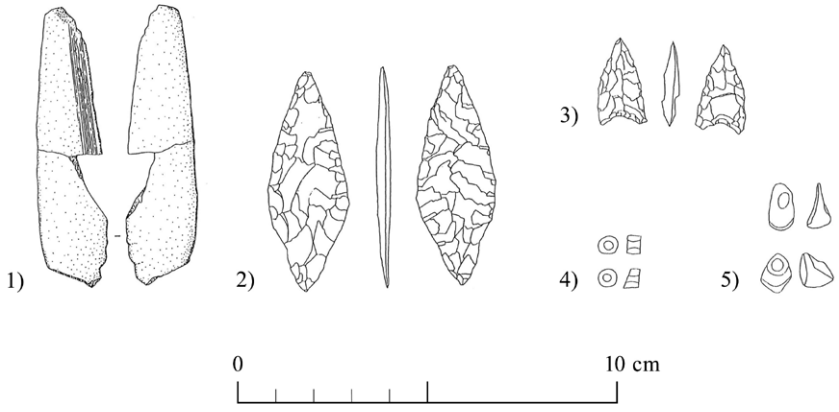


Figure 25: Aime, Le Replat. Grave goods: 1) bone tool from T1, 2) arrowhead from T6, 3) arrowhead from T6, 4) jet disc beads from T5, 5) stone beads from T5 (source: © Gély et al. 1991).

Grave Tombe 3

- Grave architecture: Rectangular stone cist consisting of four lateral stone slabs and an additional smaller stone in the southeast corner of the grave (with a length of 111 cm and width of 68 cm). An irregular capstone (up to 220 cm long and 120 cm wide) was placed on top of the lateral stone slabs, overhanging them by 10 to 40 cm.
- Human remains: The poorly preserved bones of one adult individual were found. The remains were probably similarly placed as the ones from Tombe 1, in a supine position with the legs bent to the left side and the knees clearly below the level of the pelvis. The left hand was originally placed on the chest, and the right hand was probably on the hip. In the eastern area of the tomb, three teeth and a slight discolouration of the soil mark the original position of the skull (it is unclear if the skull was found or had been removed) (Fig. 24).
- Grave goods: 15 jet disc beads were found near the neck area of the buried individual (with four additional beads originating from the grave backfill). In addition, a trapezoidal stone object and three fragments of red pigment were found; one under the right hand, and the other two about 5 cm below the grave floor (for the excavators, it was therefore unclear whether the latter could be addressed as grave goods).

Grave Tombe 4

- Grave architecture: Four lateral stone slabs formed a slightly trapezoidal stone cist with a total length of about 117 cm and a width of 62 cm. A capstone (of at least 140 cm in length and 100 cm in width) was placed on top, but an additional smaller stone slab had to be placed to fully close the grave horizontally.

- Human remains: The grave contained the remains of at least two individuals. The nearly complete skeleton of a 30- to 60-year-old male (Indiv. 1) was in a similar mortuary position as the individuals of Tombe 1 or 3; on its back, with flexed legs and the head to the east. The second individual (Indiv. 2) is preserved only as some skull fragments and teeth.
- Grave goods: A rock crystal fragment and a fragment of red ochre were found in the eastern part of the tomb (an additional rib fragment of a herbivore was mentioned).

Grave Tombe 5
- Grave architecture: Four lateral stone slabs form a trapezoidal stone cist of 130 cm in length and 58–70 cm in width. The large capstone (180 cm long and 150 cm wide) overhung the side slabs by 20–50 cm.
- Human remains: Within the stone cist, the remains of at least four individuals were found. Indiv. 1 is a primary burial of an adult individual younger than 40 years placed in the northern half of the grave. The skeleton was lying on its left side, with the lower back and pelvis moved against the northern lateral slab. The lower limbs were flexed to at least pelvic level. Indiv. 2 is probably a younger (adult?) female who was placed directly on top of Indiv. 1. The disturbed bones indicate an initial position on the left side. The remains of an approximate 15-year-old (Indiv. 3) were found in the southern part of the stone cist. Only the upper half of the body was preserved, and in contrast to the other burials, this individual was placed with the head to the west. Indiv. 4 is only represented by a single skull fragment found near the pelvic area of Indiv. 1 (Fig. 24).
- Grave goods: By the chest of the primary burial (Indiv. 1), some 35 jet disc beads, two drop-shaped pendants of greenstone, and a small fragment of light brown ochre were found. Additionally, an ulna of a bear was uncovered near the northwest corner of the grave and a quartz/crystal fragment was found in the southeast (Fig. 25).

Grave Tombe 6
- Grave architecture: Rectangular stone cist formed by four lateral stone slabs (about 115 cm long and 52 cm wide). A capstone was not present, but several stone fragments inside and around the grave could originate from a missing or destroyed cover stone.
- Human remains: Within the grave, the poorly preserved remains of at least three adults and a child of approximately 10 years old were found. The bones were strongly mixed, with only one femur and one pelvis bone still in anatomical connection, allowing only a few conclusions regarding the original position of these individuals. The skull fragments are grouped in the eastern part of the grave and most long bones (of the legs?) were found in the western half of the grave, indicating an east-west orientation. Based on the number of bones, primary burials are likely in the case of two individuals, while the two others are only represented by skull fragments (Fig. 24).
- Grave goods: 48 jet disc beads were found in the area of the skulls. A diamond-shaped flint arrowhead and a triangular arrowhead of rock crystal with a concave base originate from the centre of the grave. Finally, traces of yellow pigment and two undescribed animal bones are mentioned (Fig. 25).

V. Burial practice

Regarding primary burials, placement in the supine position was clearly preferred among individuals from Aime compared with other Chamblandes sites. An outlier is Indiv. 3 from Tombe 5, who was buried with the skull towards the west in the opposite direction to the other individuals of this specific grave and the entire site. A comparable example of this practice can be found in grave Sp. 4 at Montagnieu, Grotte-du-Souhait (Gatto, 2012, 66). Some findings indicate that the individuals were bound by organic material or wrapped (Gély et al., 1991, 42).

Isolated skull fragments found in Tombes 4, 5, and 6 indicate secondary burial practices: either the clearing out of most other human remains from stone cists or, more likely, the deliberate deposition of skulls. Based on the number of individuals and the probable presence of secondary burial elements, Tombes 5 and 6 can be considered as multiple burials (whether these are multiphase collective burials cannot be determined, as a simultaneous burial of these human remains cannot be excluded).

VI. Grave goods

The individual objects found with the human remains in the stone cists were covered in the individual grave descriptions. Every grave contained at least some grave goods, and they generally showed strong similarities, as diverse animal bone elements were found in almost every grave (bone awl in Tombe 1, an ulna of a bear in Tombe 5, and undescribed animal bones in Tombes 3 and 6). With the exception of Tombe 1, all graves contained colour pigments, some together with arrowheads and rock crystal fragments. Finally, jet disc beads found near skulls indicate the use of necklaces in the burial dress in Tombes 3, 5, and 6.

4.2.2. Bourg-Saint-Maurice, Le Châtelard

I. Context

The burial site is located on Mollaret-des-Granges, a plateau on Le Châtelard mountain (between 886 and 976 m in altitude) in the municipality of Bourg-Saint-Maurice, situated at the eastern end of the Tarentaise Valley (some 15 km east of Aime) at the foot of the Little St. Bernard pass.

II. Background

Between 2003 and 2007, several small excavation campaigns and a set of radiocarbon dates were carried out around Little St. Bernard, within the research project "Interreg III Alpis Graia: Archéologie sans frontière. Premières occupations humaines autour du col du Petit-Saint-Bernard", resulting in a number of Neolithic sites discovered on both sides of the Alpine pass (Rey and Moulin, 2018, 251). Three stone cists (named II-1, II-3, and II-4) and a pit grave (II-2) had already been discovered between 1972 and 1976, during the excavation "Chantier II(IV)" on the Mollaret-des-Granges, a small plateau on the mountain Le Châtelard. A small followup excavation (sondages 2a–b) was carried out in 2007, adjacent to the investigated area of Chantier II(IV), revealing two disturbed stone cists (named T1 and T2) that were not fully excavated (Rey et al., 2012, 738) (Fig. 26).

III. Spatial organisation of the necropolis

Generally, little data are available from this site. The disturbed stone cists are of rectangular shape and made of lateral slate stone slabs. The graves are about 80 by 40 cm and are oriented in a northeast-southwest direction (with the exception of T2, which appears to be oriented northwest) (Fig. 27). About 1 m north of the stone cists T1, T2, and II-3, a cluster of human bones was discovered, consisting mainly of the lower limbs of a 5- to 8-year-old individual (II-2). Whether this represents a simple pit grave or a burial in a wooden cist cannot be determined. It can be assumed that the necropolis was originally larger and continued on the (unexcavated) area of the plateau.

Similar to the burial sites in the Aosta Valley, no contemporaneous occupation layer (of houses or fireplaces) has yet been discovered at the Châtelard (Rey and Moulin, 2018, 243).

IV. Individual grave description

Based on the limited available data, it is not possible to give an account of the individual graves at this site.

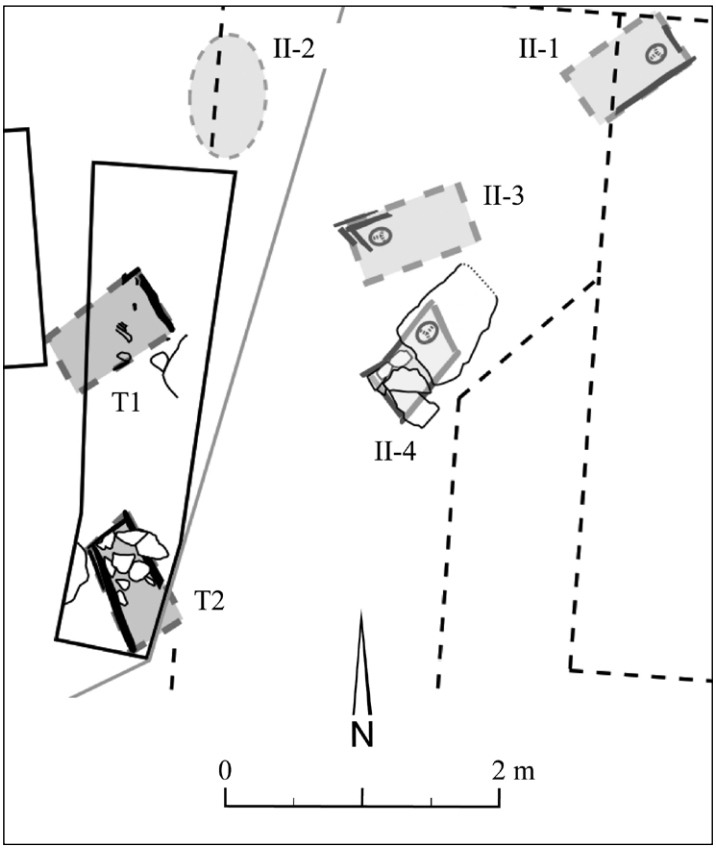


Figure 26: Bourg-Saint-Maurice, Le Châtelard. Map of the site (source: Modified by N. Steur after Rey et al. 2018).

V. Burial practice

The preserved human remains of Burials II-1 through II-4 indicate single burials of 4- to 9-year-old individuals, while the stone cists T1 and T2 probably contained adults (Rey and Moulin, 2018, 7). The orientations of the graves varied and suggested prolonged phases of use of the necropolis. Skull fragments found in the southeastern corner of stone cist II-3 could indicate a southern orientation of some burials (Rey et al., 2012, 753). Based on the limited data, the practice of single, primary burials within stone cists seems most likely for this site.

VI. Grave goods

No objects were mentioned for any of the graves.

4.2.3. Outlined site

Bellecombe, Torrent du Morel

Overview: Several graves were discovered near the banks of the Torrent du Morel, a tributary river of the Isère, during earthworks after a flood in 1859. Located in the former municipality of Bellecombe (now Grand-Aigueblanche) in the lower Tarentaise (at an altitude of about 470 m), the site was visited by Étienne-Louis Borrel, who reported that each grave was formed with six stone slabs. The graves were aligned in an east-west direction and about 190 cm long and 70 cm wide. The position of the bones indicated that the deceased lay on their backs with their arms stretched to the sides. Due to the lack of grave goods, dating of these burials was difficult (Borrel, 1884, 71–72).

A few years later (possibly in 1875), smaller graves were discovered below these first burials, separated by a layer of alluvial gravel. Borrel was able to document that they

Figure 27: Bourg-Saint-Maurice, Le Châtelard. Top view of T2 (source: Rey et al. 2018, © Pierre-Jérôme Rey - UMR 5204 Edytem).

consisted of vertical stone slabs and were about 90 cm long and 70 cm wide. Thus, an interpretation of them as stone cists is reasonable. The human remains within these graves showed positioning with flexed lower limbs. No grave goods were mentioned, but already, A. Schenk suspected them to be Neolithic (Schenk, 1912, 485). According to Pierre-Jérôme Rey (communication, 2020), no human remains or additional data from this site are available.

4.3. Upper Rhône Valley

The research focus in this zone was centred on Saint-Léonard, Les-Bâtiments (Chapter 4.3.1), and Sion's Place et Rue des Remparts (Chapter 4.3.2), as well as five outlined sites located within the municipality of Sion (Chapter 4.3.3) (for the location of sites, see Fig. 4).

4.3.1. Saint-Léonard, Les-Bâtiments

I. Context

The site, consisting of three stone cist graves, is located in the meadow of Les-Bâtiments, east of the village of Saint-Léonard, on the northern side of the Rhône valley. It is situated at an altitude of about 500 m on the alluvial cone of the Lienne, a confluence of the Rhône River. The presented data on this site are largely based on the published articles of excavation director Pierre Corboud (Corboud, 1986; Corboud et al., 1988).

II. Background

The first grave (Tombe 1) was discovered in July 1975, 2 to 3 m below modern ground level, during construction work in the cellar of the house of Mr. P. Pellaud. Three short archaeological excavation campaigns followed in August 1975, September 1976, and January 1977, revealing two further stone cist graves (Tombes 2 and 3). The three graves were investigated in an area of only about 11 m^2 and probably reflect a section of a larger necropolis, which may have been preserved under the surrounding buildings (Fig. 28).

Stratigraphy: Pierre Corboud was able to document about 1 m of the sequence of the layers in the basement of the building of Mr. Pellaud (Corboud et al., 1988, 2). It can be divided into four layers (from top to bottom):

- Layer 1, fine, light brown loess with some gravel, representing deposits of slope erosion occurring after the usage period of the cist graves.
- Layer 2, approximately 5 cm thick gravel level with brown loess sediment, reaching a few centimetres above the edges of the grave pits and the capstones.
- Layer 3, reddish-brown sand and gravel with loess sediment. The prehistoric ground level was observed on top of this layer and the burial pits were dug directly into this sediment. The heterogeneous backfill of the burial pits consists of greyish-brown gravel and is probably excavated material from Layer 3.
- Layer 4, about 70 cm thick with big gravel and grey loess sediment, probably originating from the Lienne River, whose course in its present location runs about 800 m west of the site.

III. Spatial organisation of the necropolis

The construction of the stone cists appears largely identical to other necropolises in the study region; a pit was dug and two narrow stone slabs were placed at the bottom. Two longer lateral slabs were added, leaning against the first two plates. Smaller stones and soil backfilled the space between the placed stone slabs and the pit wall, wedging the formed stone cist. Small slate plates levelled the upper edge of the lateral stone slabs, to allow a relatively close fit of the capstone.

It was observed that the upper edge of the lateral stone slabs of Tombes 2 and 3 were 15–30 cm below the initial level of the grave pits, indicating that the capstones might have been covered in sediment, making them no longer visible or accessible at the prehistoric ground level. This raises the question if the graves were superficially marked in some form, especially if we assume multiple usage phases for these stone cists. In this context, Mr. Pellaud pointed out an elongated stone (30–40 cm in length), which he found vertically placed in front of Tombe 2 (Corboud et al., 1988, 4).

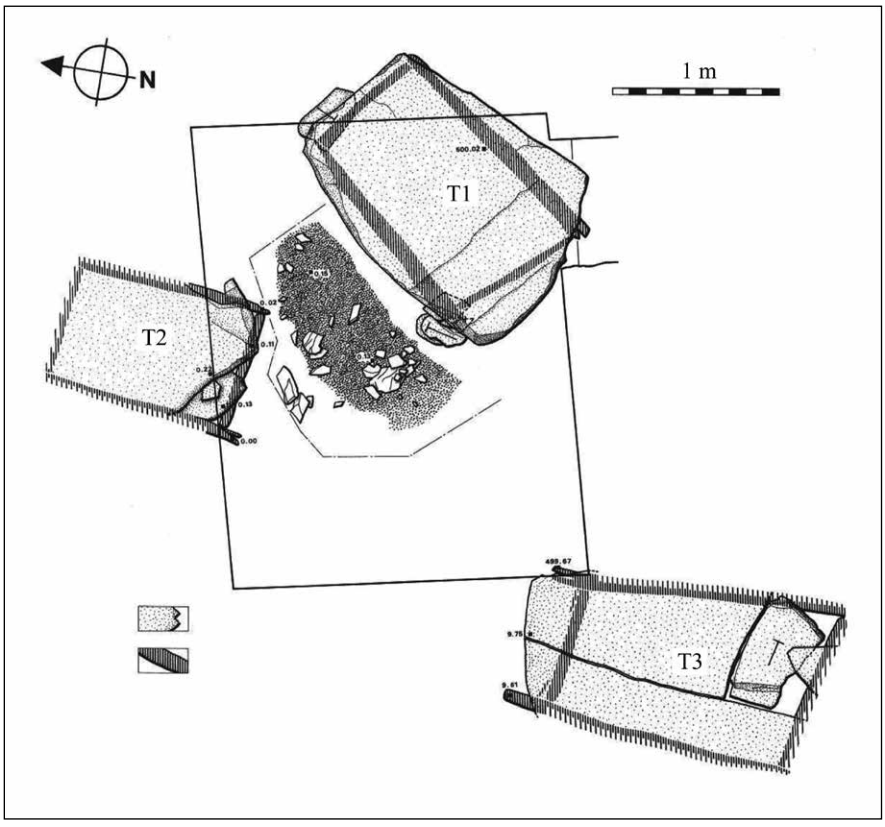


Figure 28: Saint-Léonard, Les-Bâtiments. Map of the site (source: Corboud et al. 1988).

Two hearths with few bone fragments were noted during the excavation campaigns. The first was cut by the burial pit of Tombe 1 and lies about 20 cm below the height of the bottom of Tombe 2 and must therefore be older than the stone cists. Similarly, the second hearth, located about 1 m southeast of Tombe 3, was found 15–20 cm below the edge of the burial pit and is therefore considered to be older than the grave. Unfortunately, it was not possible to collect enough charcoal material for radiocarbon dating of these features (Corboud et al., 1988, 4).

Surrounding Neolithic sites: Between 1957 and 1962, Marc-Rudolphe Sauter investigated Neolithic settlement structures on the rock ridge Sur-le-Grand-Pré, approximately 500 m east of the graves from Les-Bâtiments. Based on the characteristic fluted decorations of the pottery, the Saint-Léonard variety of the Cortaillod ceramic style was defined. The recovered objects largely date to the 4th millennium BCE and therefore after the assumed usage period of the covered graves from Les-Bâtiments. A small stone cist was found on Grand-Pré, but it did not contain any human remains. Based on the construction, it was comparable to the infant stone cist graves of Sion, Petit-Chasseur (Winiger, 2009, 20).

In 1912, rock carvings were found on the Crête des Balmes, located about 200 m southwest of Grand-Pré. Based on the style, condition, and overlay of motifs, it was possible to divide these rock carvings into four phases dating between the Early/Middle Neolithic to the Bronze Age. Especially the first phase could be contemporaneous with the stone cist graves, showing similarities with features documented on the standing stones of Sion, Chemin des Collines (Corboud, 2003).

IV. Individual grave description

Grave Tombe 1

- Grave architecture: Rectangular stone cist formed by four lateral stone slabs and a capstone. These stones were well fitted and almost no sediment penetrated into the

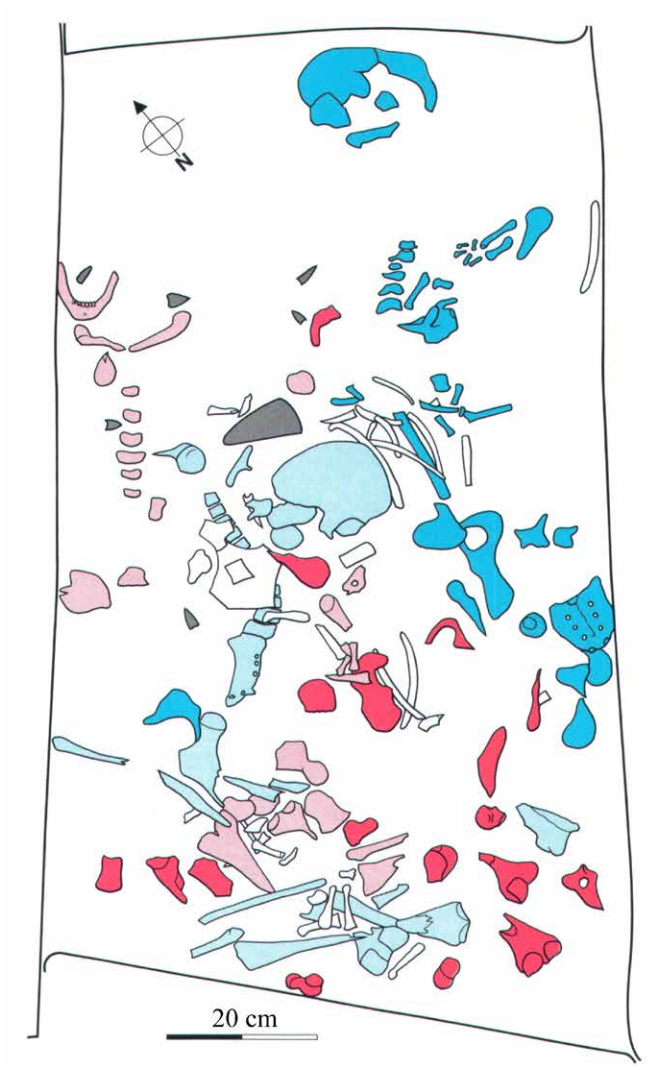


Figure 29: Saint-Léonard, Les-Bâtiments. Plan of T1, colours representing different individuals (source: Corboud et al. 1988).

grave. The side slabs are of local slate, while the capstone is of limestone and may have originated from the Crête des Balmes. The grave was about 130 cm long and 74 cm wide and oriented northwest-southeast.

- Human remains: Due to the lack of protective backfill and the infiltration of seepage water, the bones were poorly preserved and disturbed. The MNI amounts to four, consisting of one male juvenile (Indiv. 1A) between the age of 15–19 years and three adult individuals: one male (Indiv. 1D) and two females (Indiv. 1B and 1C). The scattered remains of Indiv. 1A were found in the lower, southern area of the stone cist, while the disturbed spine of Indiv. 1B was recovered along the western lateral stone slab. The spine and skull of the older female (Indiv. 1C) were still partially in anatomical connection and located in the northeastern area of the stone cist. The skeleton of the male Indiv. 1D was well preserved and placed centrally within the grave, presumably above the other burials. The different states of preservation and the position of the bones indicate several burial phases of primary burials in an originally crouched position. It is likely that the human remains of Indiv. 1A, 1B, and 1C were displaced for the placement of Indiv. 1D (Fig. 29).
- Grave goods: Over 100 fragmented white beads of blue stone seed were found concentrated around the chest level of the individuals. In addition, seven triangular arrowheads (six made of flint and one of greenstone), a stone axe blade made of serpentinite, and an animal bone (rib fragment of a cow) were recovered (Fig. 30).

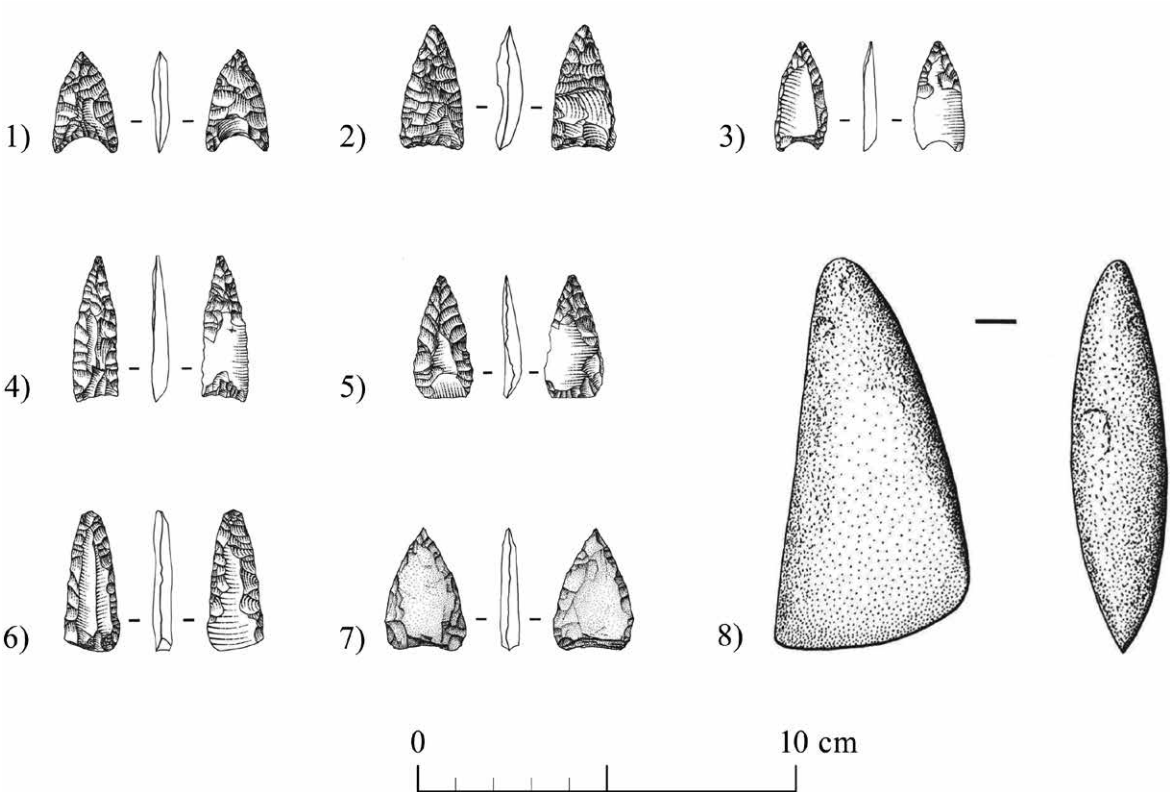


Figure 30: Saint-Léonard, Les-Bâtiments. Grave goods from T1: 1–6) flint, 7–8) greenstone (source: Corboud et al. 1988).

Grave Tombe 2

- Grave architecture: Rectangular stone cist formed of four lateral stone slabs and a capstone made of local slate. These stones were well fitted, largely preventing sediment from entering the grave. The internal dimensions of the cist are about 102 by 68 cm. Since the grave was located under the foundation wall of Mr. Pellaud's house, the capstone could not be recovered and the cist had to be examined laterally from the southern side.
- Human remains: Despite the lack of protective backfill, the bones were significantly better preserved than in Tombe 1. The MNI amounts to three primary burials: an adult male (Indiv. 2A), an adult female (Indiv. 2B), and a 14- to 15-month-old infant (Indiv. 2C). The two adult individuals were lying on their left side, with flexed legs (with the knees slightly below the level of the pelvis) and the head to the north facing east. Based on the location of the bones, the female, Indiv. 2B, was placed first in Tomb 2, followed by the infant (Indiv. 2C) and, finally, the male, Indiv. 2A. Displacements of bones of the first two individuals indicate successive burials (with the first two individuals already in a decomposed state) (Fig. 31).
- Grave goods: About 80 fragmented white beads of blue stone seed were found at the level of the pelvis of the adult individuals (indicating that these could have been sewn onto a garment or belt). Other finds include seven arrowheads made of different materials (two flint, two greenstone, two rock crystal, and one of quartz), a stone axe blade made of serpentinite, a rock crystal fragment, a flint blade and some bird bones documented in the southern area of the stone cist (Fig. 32).

Grave Tombe 3

- Grave architecture: A rectangular stone cist formed by four lateral stone slabs and a fragmented capstone of local slate. The grave was around 140 cm long and 90 cm wide, and oriented in a north-south direction. In contrast to the other graves, sediment was able to enter Tombe 3 through the fragmented capstone, completely

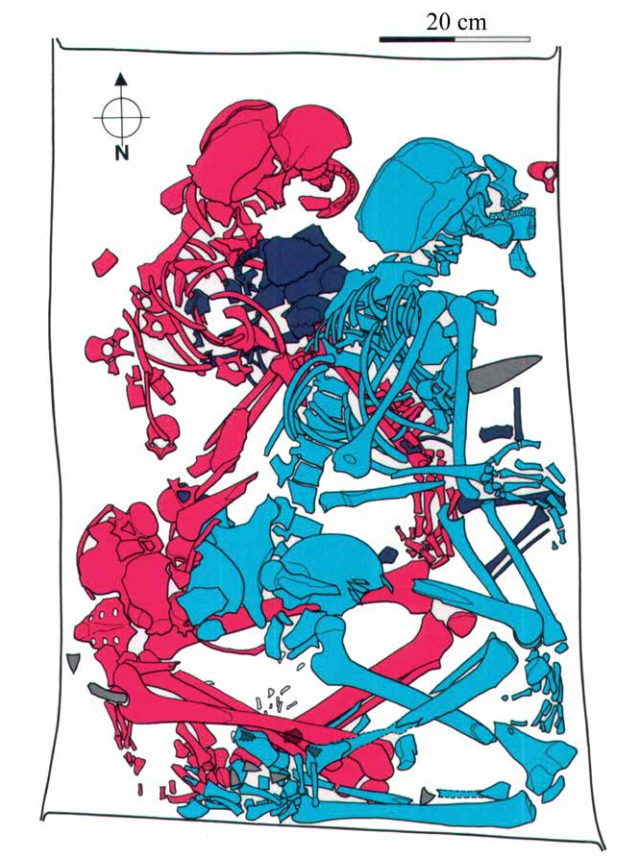


Figure 31: Saint-Léonard, Les-Bâtiments. Plan of T2, colours representing different individuals (source: Corboud et al. 1988).

filling the stone cist. Similar to Tombe 2, this grave was discovered under the foundation wall of Mr. Pellaud's house, and the cist had to be examined from the side.

- Human remains: The MNI amounts to four individuals, consisting of the bones of a 10- to 14-year-old individual found scattered within the grave. The skeleton was incomplete, and no anatomical connection could be documented. Below these remains, a layer of calcined human bones was found, clustered in the centre of the grave. The total of 1367 bone fragments had a combined weight of 1099.6 g, illustrating the strong fragmentation of the calcined bones. Of the calcinated bone fragments, 14% could be anthropologically determined, with the most frequently skeletal elements being skull and long bones, as well as ribs and vertebrae. All skeletal elements were represented, and there is no clear evidence of selection of certain bones. Based on the different jawbone fragments, the calcined bones originated from at least three individuals: one male, one female (adult?), and a 10- to 12-year-old child (Fig. 33).
- Grave goods: One triangular flint arrowhead, an axe fragment of serpentinite, one undecorated, featureless ceramic fragment, and parts of a jawbone from a sheep and a metacarpal bone of a brown bear were recovered (Fig. 34).

V. Burial practice

All three graves from this site can be addressed as collective burials with multiple usage phases. For Tombes 1 and 2, successive primary burials can be assumed, with the displacement of (older) bones in the context of the deposition of additional individuals. In contrast, Tombe 3 shows at least two usage phases of different secondary burial practices: the placement of loose bones of one individual (maybe cleared or collected from another grave) and below the remains of at least three cremation burials. It can be assumed that the calcined bones were collected after the cremation and deposited

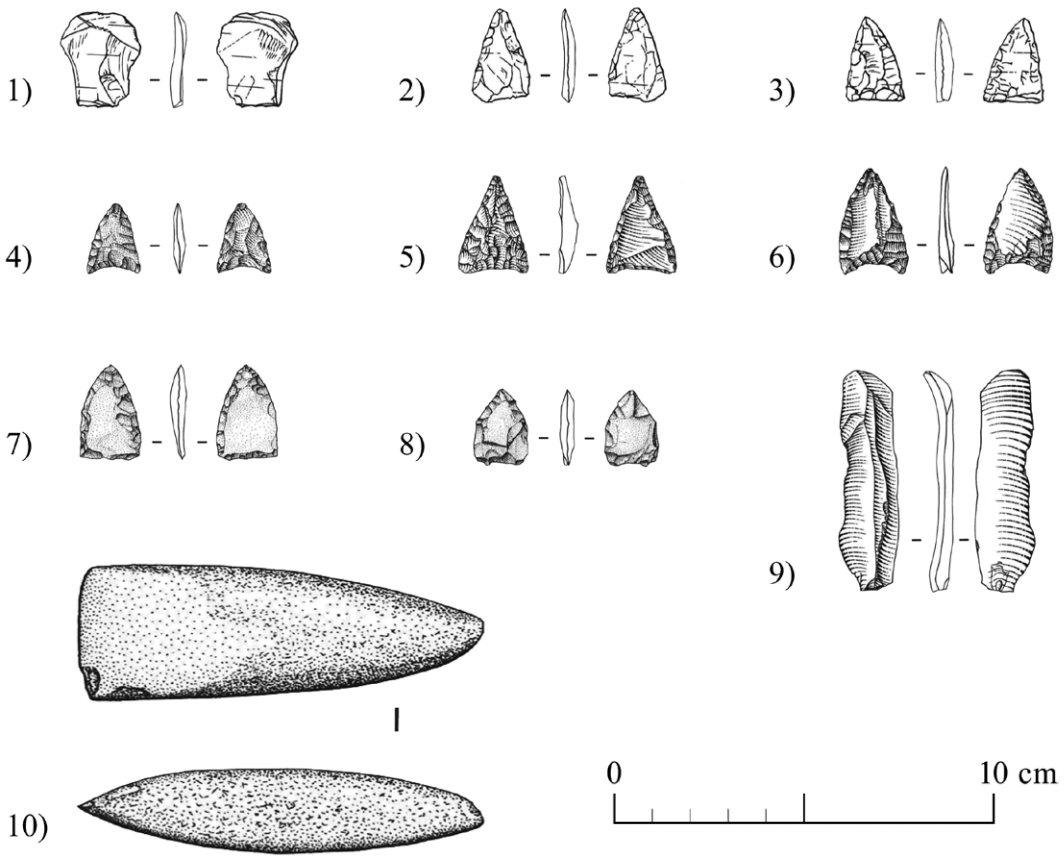


Figure 32: Saint-Léonard, Les-Bâtiments. Grave goods from T2: 1–3) rock crystal, 4) quartz, 5–6, 9) flint, 7–8, 10) greenstone (source: Corboud et al. 1988).

afterwards in the stone cist. Morphological analysis was able to show that the bones of at least one individual had already been affected by soil bacteria prior to being burned, indicating that the cremation took place after decomposition (Corboud et al., 1988, 10).

VI. Grave goods

Compared with other examined sites, a relatively large number of objects was found within these three cist graves. Unique to the research area are the dozens of beads of blue stone seed from Tombes 1 and 2. It can be assumed that they represent imitations of seashell beads. Of special interest are the different animal bones found within each grave, probably relating to performed burial rituals. Furthermore, each stone cist contained an axe blade of serpentinite and larger numbers of arrowheads made of different raw materials (flint, greenstone, rock crystal). The flint arrowheads show a wide variety of colouration. It was noted that Tombes 1 and 2 each contained one young male with seven arrowheads, a stone axe, and stone seed beads (Corboud et al., 1988, 12).

4.3.2. Sion, Place et Rue des Remparts

I. Context

The site, consisting of at least 12 stone and three wooden cist graves, is located on the street “Rue des Remparts” in the old town of Sion, at a height of 506 m. Only a limited account can be provided here, as, so far, only the preliminary report of the excavation (Mariéthoz, 2007b) and a master’s thesis from the University of Geneva covering the human remains found within the collective burials (Délèze, 2016) are available.

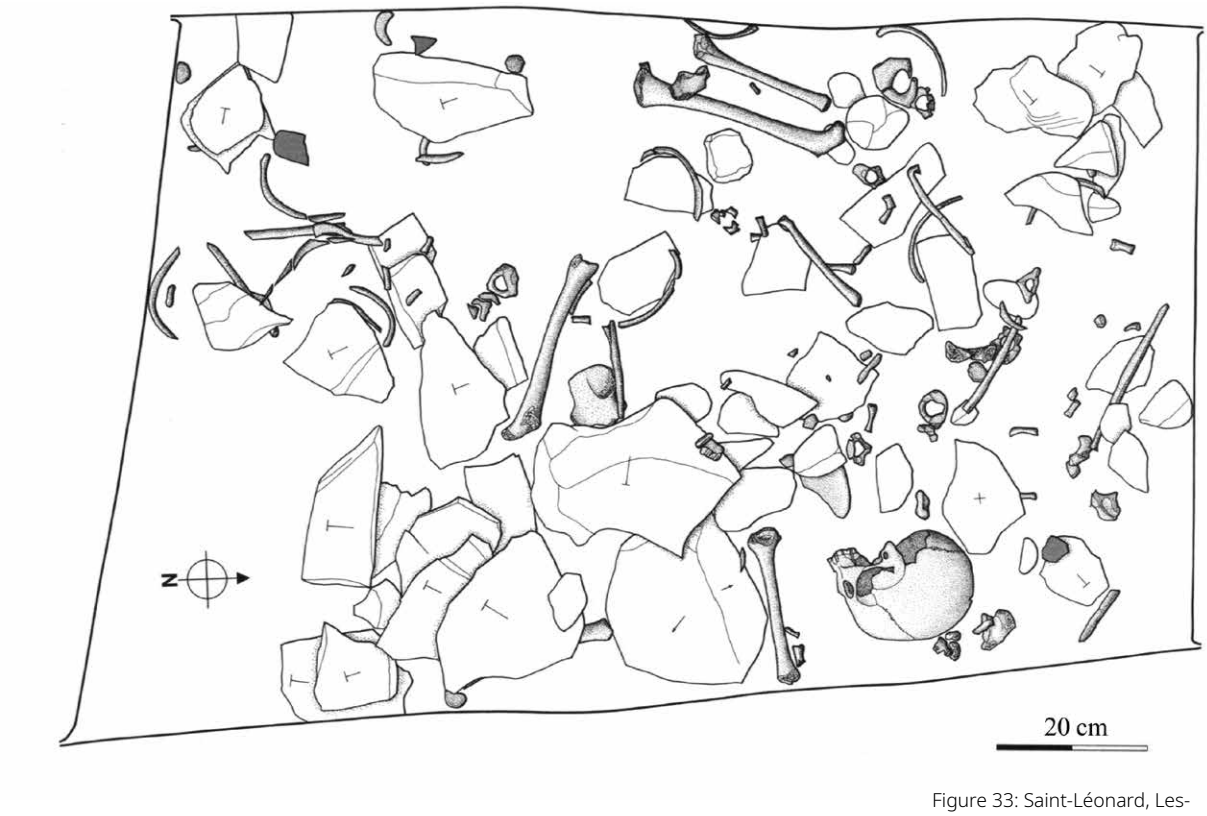


Figure 33: Saint-Léonard, Les-Bâtiments. Plan of T3 (source: Corboud et al. 1988).

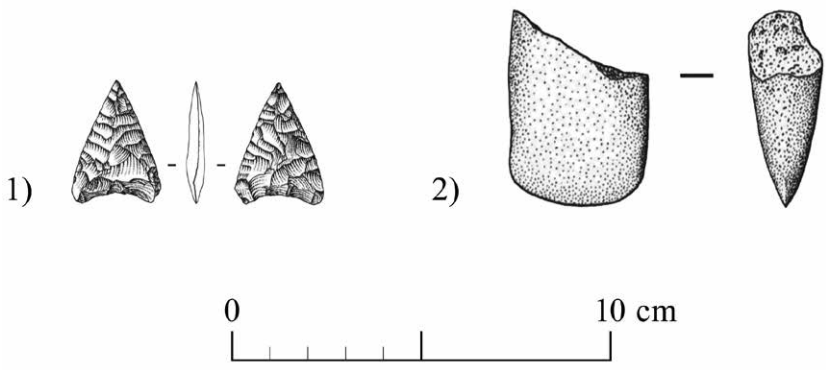


Figure 34: Saint-Léonard, Les-Bâtiments. Grave goods from T3: 1) flint, b) greenstone (source: Corboud et al. 1988).

II. Background

Following the discovery of stone cist graves during construction work, the site was investigated in two rescue excavations in 2006 (from February 14 to May 29 and December 2 to 12). The stratigraphy can be summarised as follows: under the modern surface layer, remains of the medieval fortifications were found (hence the name "Remparts"). Roman finds of the 1st to 3rd century CE followed, and below, two prehistoric occupation levels were documented. About 2 m below the modern ground level 12, poorly preserved single graves were discovered, with the grave goods dating to the Middle La Tène period. Just 4.5 m below the current ground level, the covered Neolithic necropolis was found (Mariéthoz, 2007b, 404).

III. Spatial organisation of the necropolis

The excavation of the Neolithic layer(s) identified four main zones at this site (Mariéthoz, 2007b, 404–405) (Fig. 35):

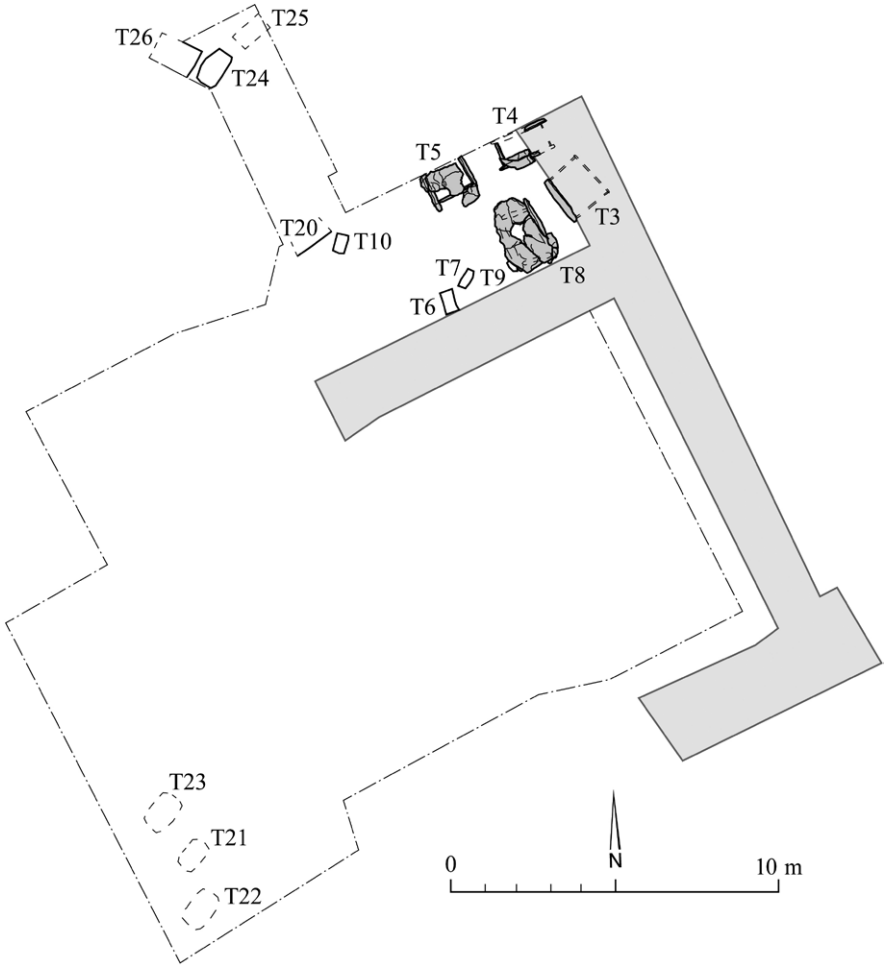


Figure 35: Sion, Place et Rue des Remparts. Map of the site (source: N. Steuri after files from the Office cantonal d'Archéologie Valais).

- A group of stone cist graves was found in the northeast of the excavation area, consisting of eight single and four collective burials (T3–10, T20, T24–26). Some of these graves were disturbed by the construction of a house in 1860, and it can be assumed that the necropolis continues/continued north below the house.
- To the northwest of the excavation area, a zone with postholes and three hearths was recorded. A ritual function was suggested for the latter, due to the relatively large dimensions between 1.5 and 2.4 m in diameter. No finds, especially no calcined bones, were found within these hearths, and the stratigraphic correlation between the stone cist graves has not yet been clarified.
- The third zone was identified in the south/southwest of the excavation area and consists of three single graves (T21–T23). The documented soil discolouration or posture of the human remains suggests burials in wooden cists.
- Lastly, a suspected settlement horizon is located in the southeast and consists of hearths, ditches, and postholes. It yielded a large number of archaeological objects, such as pottery, stone axes, flint and crystal objects, bone tools, animal bones, and charcoal.

IV. Individual grave description

So far, detailed accounts are only available for the collective burials (T3, T4, T5, and T8) and cover mainly the human remains (Délèze, 2016). Therefore, the presented data regarding these four graves have to be regarded as incomplete (especially in regard to the grave goods).

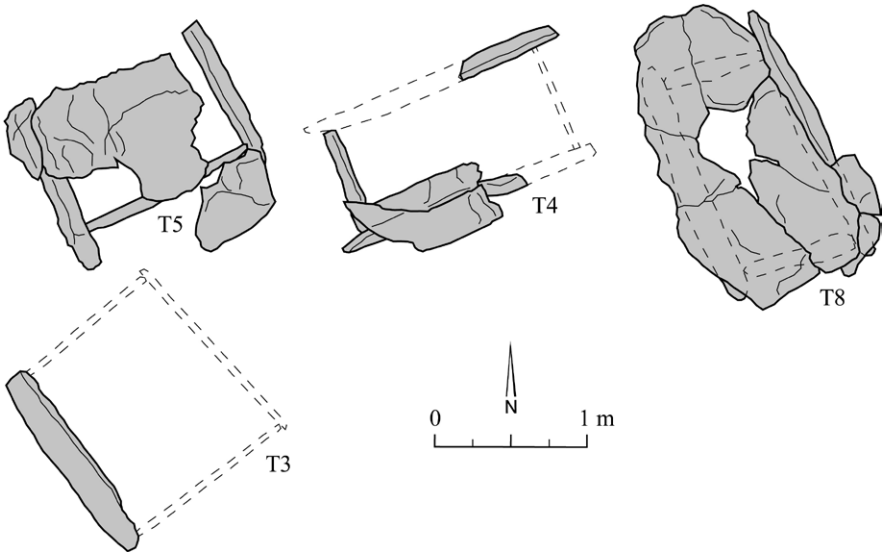


Figure 36: Sion, Place et Rue des Remparts. Plans of the four collective stone cist graves (source: N. Steuri after Délèze 2016).

Grave T3

- Grave architecture: This originally square stone cist was found heavily disturbed by construction work, and only the southwestern lateral stone slab was found in place (Fig. 36).
- Human remains: 366 bones could be anatomically investigated by Sabrina Délèze. The distribution of the different skeletal elements seems to be imbalanced, as the smaller bones are overrepresented. For example, there are only three right femora, but eight right lunate bones (middle posterior carpal bone). Age determination based on five adult pelvic bones revealed 2–3 individuals over 50 years of age (sex determination was not possible). Of the analysed bones, a total of 130 originate from five subadult individuals of different age classes (two 1- to 4-year-olds, two 5- to 9-year-olds, and one 5- to 14-year-old). The most common bone element is the right ulna (nine specimens), with eight originating from adult individuals and only one from a minor. The MNI of this grave is 13: eight adults and, due to the different age classes represented, five subadult individuals. Due to the disturbances and the state of preservation of the bones, it is not possible to determine the original placement of the individuals. The high number of individuals indicates stone cist T3 was a collective burial. Meanwhile, the low proportion of long bones was remarkable and, combined with the observed imbalance in skeletal elements, could indicate a secondary deposition of human remains (Fig. 37.1).
- Grave goods: Mentioned are beads, tools, and arrowheads of flint and rock crystal, as well as pendants made of stone.

Grave T4

- Grave architecture: Rectangular stone cist, originally formed by four lateral stone slabs and a capstone. The grave was severely disturbed by 1860s construction work and the mechanical excavator during excavation. Only the western and southern side slabs remained intact, while the other stones were fragmented or missing due to modern disturbances. The grave was around 150 cm long, 85 cm wide, and oriented northeast-southwest (Fig. 36).
- Human remains: Due to the mentioned disturbances, the bones found within the grave were very fragmented and in a poor state of preservation. Most human remains had to be hardened before examination and only 81 bones were anthropologically analysed. Two left hip bones from adult females (20–39 years old) and six bone fragments from adolescents (10–14 and/or 15–19 years old) and children

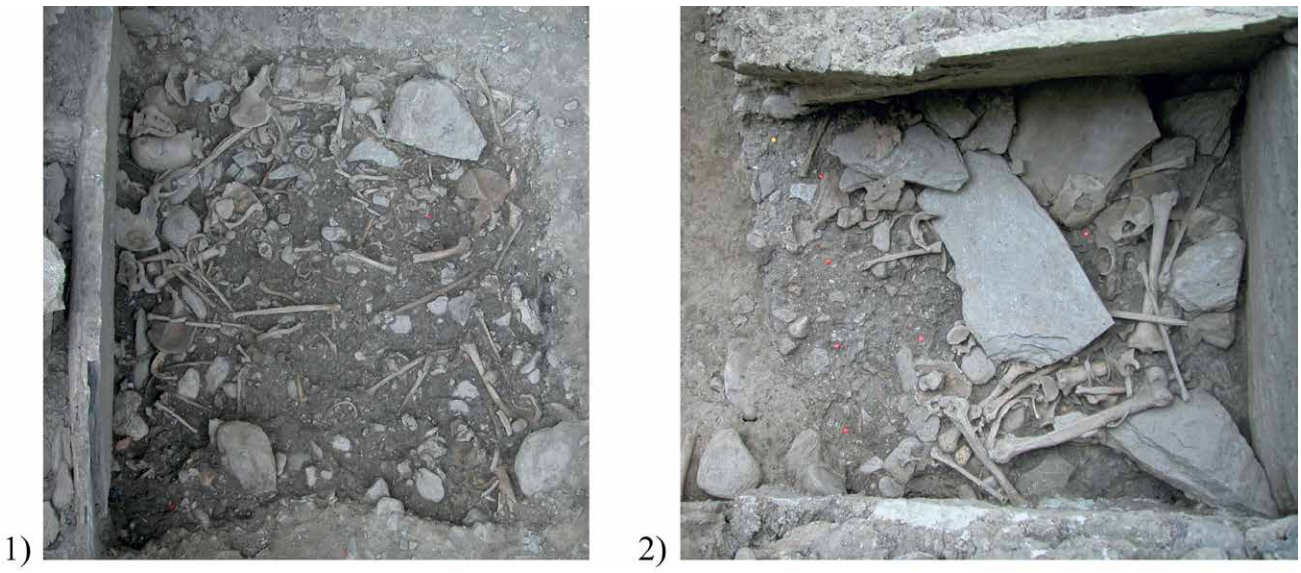


Figure 37: Sion, Place et Rue des Remparts. Selected pictures: 1) top view of T3, 2) top view of T4 (source: © Office cantonal d'Archéologie Valais).

(1–4 and 5–9 years old) were identified. The most common bone element was the right ulna, with four specimens. Age determination of the bones showed a total of three adult and four subadult individuals, raising the MNI to seven. Regarding the burial ritual, a secondary deposition of these human remains is suspected, as they were found heavily mixed (also in the undisturbed southwestern area of the grave), and small bones are underrepresented. In this context, some stone fragments were found above and below the bones, indicating a simultaneous deposition with secondary placed human remains (Fig. 37.2).

- Grave goods: Pottery, rock crystal, and a stone axe were mentioned.

Grave T5

- Grave architecture: Rectangular stone cist, originally formed by at least four lateral stone slabs and a capstone. The northern section of the grave was cut by 1860s construction work and the capstone was fragmented. The grave was oriented northeast-southwest (Fig. 36).
- Human remains: For the anthropological investigation, 268 bones in variable states of preservation could be included. The most common bone elements were right tarsal bones: seven from adults and one from a juvenile individual. Three right radial bones of subadult individuals raised the MNI to ten (seven adult and three subadult individuals). No bones were found in anatomical connection, and whole skeletal sections (mainly pelvic and long bones) are missing. This leads to the assumption of a collective grave with secondary burial practices, where some bone elements were either removed or not deposited into this stone cist (Fig. 38.1).
- Grave goods: Flint arrowheads, rock crystal fragments, stone pendants and beads, ceramic fragments, and a bone needle were mentioned.

Grave T8

- Grave architecture: Rectangular stone cist, formed by four lateral stone slabs. The fragmented capstone was still present in situ. Sediment and stones were able to leak into the grave through a central gap in the capstone. This backfill contained pottery fragments, as well as animal and human bones. The latter do not appear to be part of the burial, as they were confined to the upper area of the backfill layer and were more than 20 cm above the burials. The grave was oriented northeast-southwest (Fig. 36).

- Human remains: For the anthropological investigations, 293 bones and 89 teeth could be included. The bones are relatively well preserved. Some complete long bones, for example, were recovered, and some skeletal elements could still be found in anatomical connection. For age and sex determination, seven pelvic bone fragments were used, originating from at least two adult males, one adult female, and an individual under 60 years old of undetermined sex. There was no evidence of subadult individuals among the human remains. The most common bone element was the right petrous bone, with five specimens, but one was from the upper part of the backfill (and may not have been part of the burials). In addition, the recovered teeth indicate at least four individuals. Primary burials can be suggested for this grave, as most bone elements are represented equally and some could still be recovered in anatomical association. The mixing of the bones is probably due to taphonomic factors or later disturbances (Fig. 38.2).
- Grave goods: In the southern area of the grave, disc beads (jet?) and a bone tool (awl) were mentioned.

V. Burial practice

The eight single graves contained three adult and five subadult individuals (one could only be determined through the soil discolouration and the size of the grave). Based on the available pictures and unpublished excavation documentation, the three adult burials (T24–26) can be described as primary burials. They were placed on their left side, with flexed legs and their head facing towards the northeast. The individual from T26 differs, with a south-north orientation and the head to the south (facing southwest). In contrast, the human remains within the stone cists T6, T7, and T10 appeared disturbed. At this point, it is not possible to determine if this was due to 19th-century construction work, or related to burial practice. In this context, T9 represents an accumulation of human remains southwest of the collective stone cist T8. It can be suggested that these bones were removed from the collective stone cist, similarly to other examined sites (e.g. at Niederried or Montagnieu).

The individuals buried in supposed wooden cists (T21–23) were placed on their left side, with flexed legs (with the knees above pelvis level) and the head oriented northeast, facing southeast (Fig. 38.5).

The four presented collective stone cist graves contained up to 13 individuals, and secondary deposition of human remains was suggested for T3–5. Evidence for the placement of primary burials could only be observed within T8.

VI. Grave goods

The available data are very limited, but a relatively large and diverse number of objects are mentioned for the four collective graves (Délèze, 2016). The grave goods consist of jet disc beads, bone tools, or flint and rock crystal arrowheads. Regarding the single burials, a perforated Glycymeris seashell was found by the forearm of the individuals of T20 and T24 (Fig. 38.3–4).

4.3.3. Outlined sites

Sion, Sous-le-Scex

Overview: The site is located at the southern foot of the Valère, a 615 m high hill east of the old town of Sion. During multiple excavation campaigns, mainly in the 1980s, a larger area was examined, and the more-than-seven-metre-high stratigraphy shows an almost continuous sequence of layers dating from the Néolithique ancien to Medieval. Detailed information about the prehistoric layers of this site has been published by Matthieu Honegger (Honegger, 2011). Here, only key data relevant to the discussion of the research questions are presented.

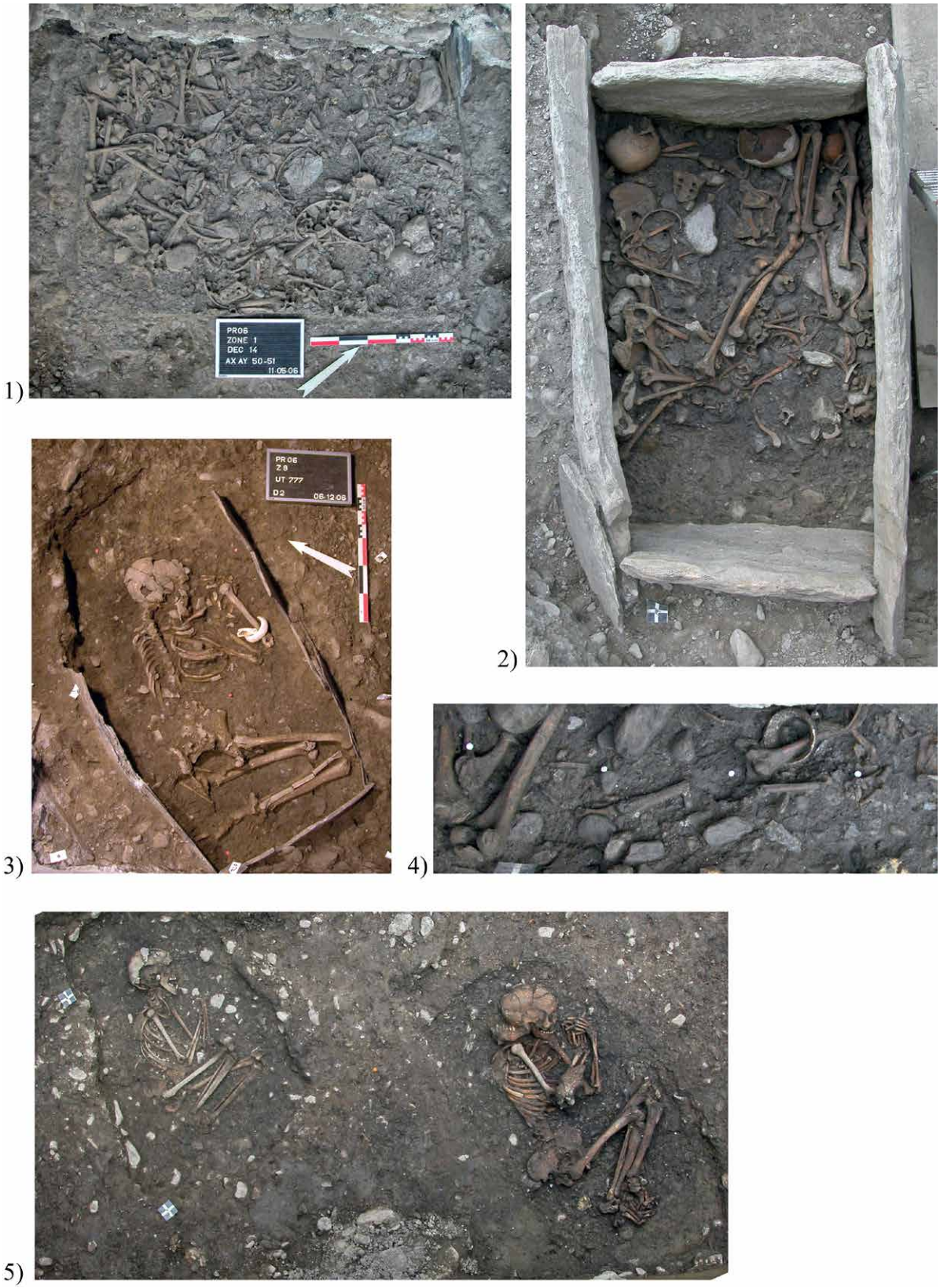


Figure 38: Sion, Place et Rue des Remparts. Selected pictures: 1) top view of T5, 2) top view of T8, 3) top view of T24, 4) detail of shell bracelet of T20, 5) top view of T21 and T22 (source: © Office cantonal d'Archéologie Valais).

The Neolithic graves were mainly found in the four layers from 18 to 15 and consisted of 13 stone cists and three pit burials (named "en plain terre"). The rectangular stone cists were formed by four to six lateral stone slabs, and Honegger could detect the development of the burial ritual with respect to the orientation of the graves; from north-east-southwest (Layer 18), to north-south (Layer 16), to east-west (Layer 15; Honegger, 2011, 91, 117–118) (Fig. 39).

These are mainly primary burials of single individuals in a crouched position on the left side of the body (except for pit grave T8, where the individual was placed on the right side). The exceptions were some bones of a neonate next to the primary burial of an adult female in T23, and, within grave T22, where the remains of two infants were detected. In addition, stone cist grave T4, the largest of the site, was a collective burial of four adult individuals (2 to 3 of which are presumed secondary burials). Of the total 21 individuals, 12 were adults and nine were subadults, and the sex could be assessed for ten individuals, showing a clear majority of female burials (n = 8). Only a few grave goods were found within the graves: a rock crystal arrowhead, pottery sherds, and ochre pigments in T5, two flint blades and calcined animal bones in T14, and ochre pigments in T17 (Honegger, 2011, 117–118).

Sion, Chemin-des-Collines

Overview: The site is located on the street "Chemin-des-Collines" in the old town of Sion, about 80 m northwest of the known double row of 13 standing stones of the same name. Anthropomorphic and geometric carvings were found on six of these stelae, which are believed to be from the Neolithic (a correlation with the stone cist graves is questionable).

In 1988, a necropolis of 25 graves was excavated and consisted of 23 stone cists and two wooden cists (Fig. 40). Clear evidence for a casing of organic material was found only in T10, but similar grave construction was assumed for the disturbed grave T11 (Fig. 41). The rectangular stone cists were constructed of lateral stone slabs, with the sides occasionally being formed out of overlapping smaller stones. They were covered by capstones uniformly oriented in a northeast direction. The graves were homogeneous and regularly distributed, with only one overlap of the stone cist T2 constructed on top of T11. The stone cists contained primary burials of single individuals with two exceptions: a double burial in grave T20 and, for T2, a "réduction" was mentioned, implying remains or traces of a second individual. The primary burials were placed in a crouched position on their left side, with the head in the northeast, facing southeast. Of the 26 analysed individuals, 12 were adults, including six females and four males, and 14 were subadults (Moinat et al., 2007a, 288–293).

The grave goods consisted of one perforated Glycymeris seashell found within each grave T9 and T24, as well as two perforated boar tusks from T10. Since these objects were found near the humerus of the buried individuals, they can be addressed as bracelets (Fig. 42). Further, red ochre pigments were noted near/on the skulls of five individuals from graves T6, 14–16, and 18 (Moinat et al., 2007a, 293–294).

In 1989, contemporaneous settlement layers featuring hearths, pits, or post holes and dating between 4500 and 4200 BCE were excavated 10 m east of the graves. In relation to this occupation horizon, an isolated stone cist was found in 2010, but no further information is available so far (Mottet and Giozza, 2010, 326–328).

Sion, Avenue Ritz

Overview: The site is located on the street "Avenue Ritz" in the old town of Sion, at a height of 522 m. Construction work in 1987 led to the discovery of stone cist graves, and during the subsequent excavation, 14 graves could be documented (Fig. 43). The rectangular stone cists were constructed of lateral stone slabs, with the sides occasionally formed by overlapping smaller stones. They were covered by one or multiple capstones oriented in a northeast direction. The stone cists contained single, primary burials, with the exception of T4, where bones of a second individual were found (Moinat et al., 2007a, 280–283).

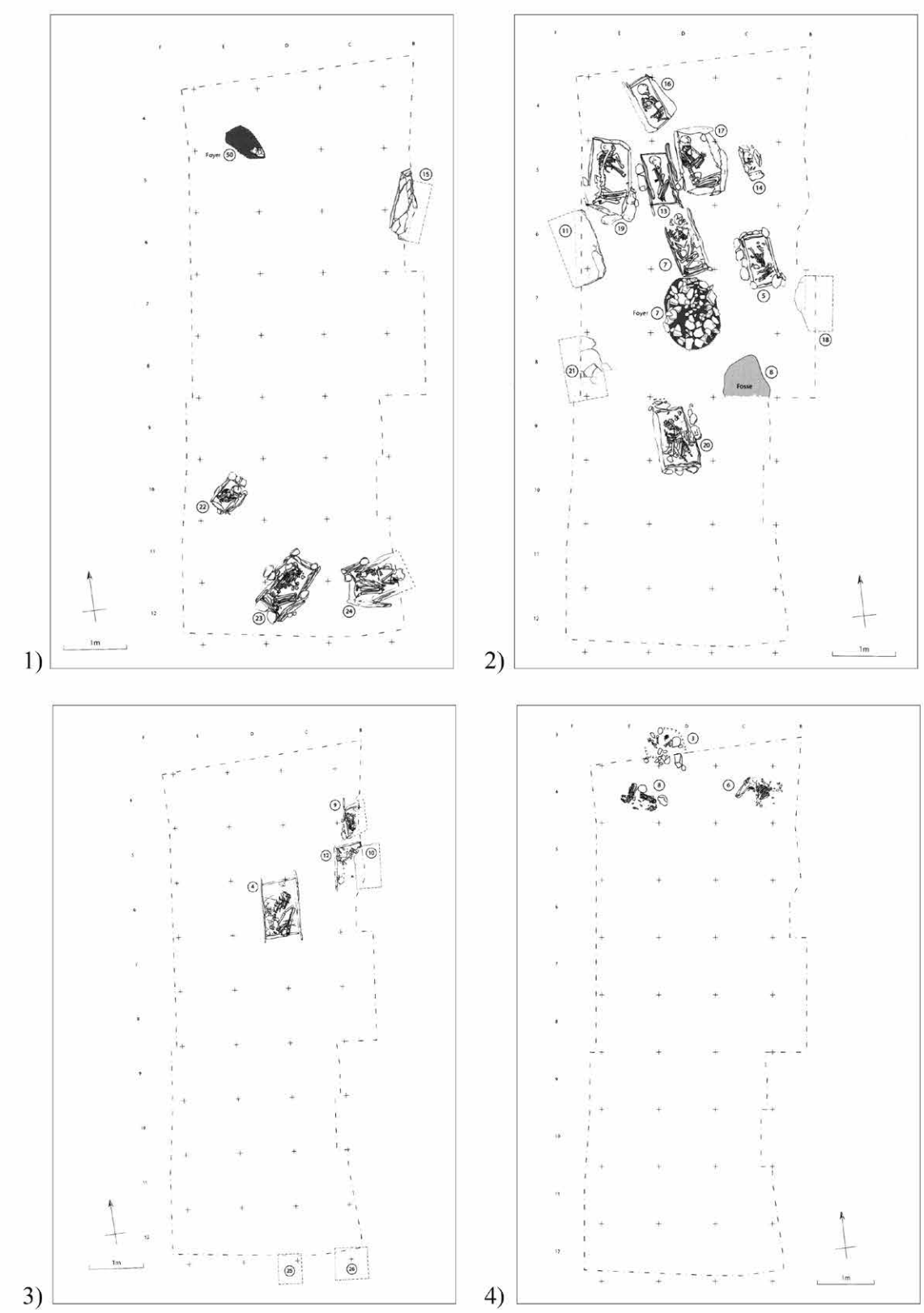


Figure 39: Sion, Sous-le-Scex. Maps of the site: 1) layer 18, 2) layer 17, 3) layer 16, 4) layer 15 (source: Honegger 2011).

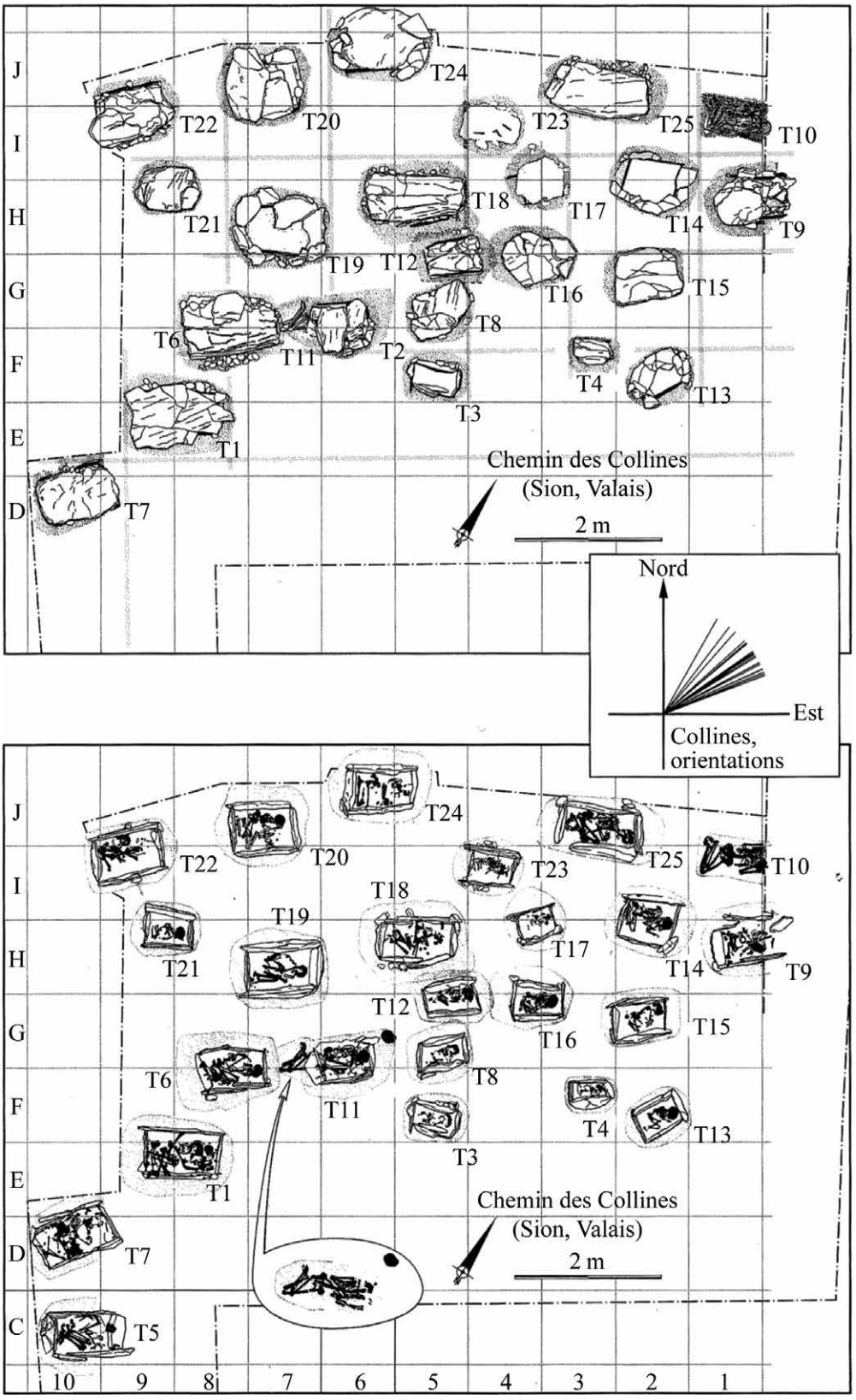


Figure 40: Sion, Chemin-des-Collines. Map of the site (source: Moinat et al. 2007).

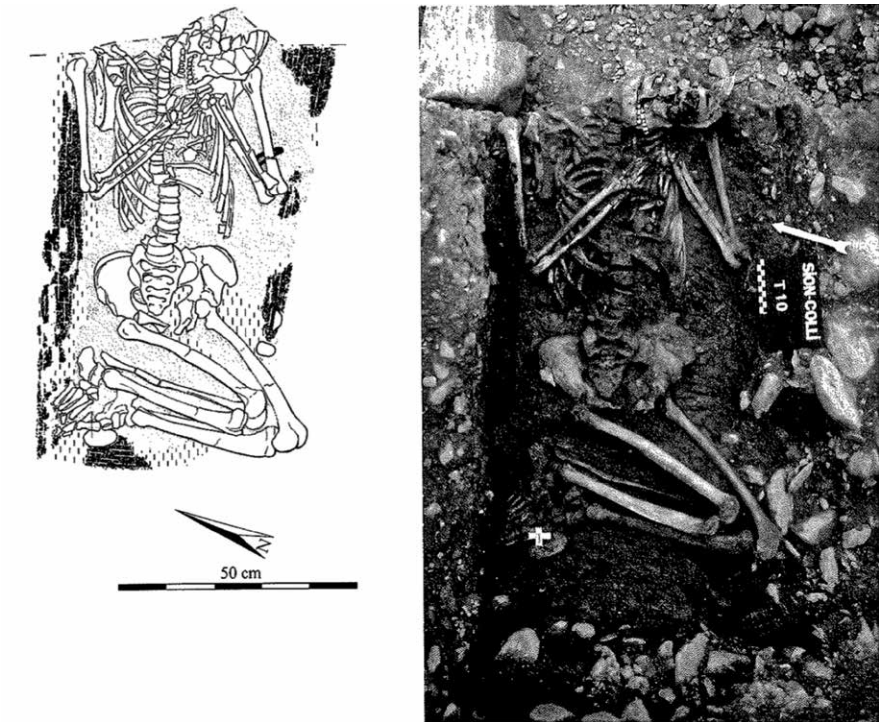


Figure 41: Sion, Chemin-des-Collines. Drawing and picture of T10 with remains from a wooden cist (source: Moinat et al. 2007).

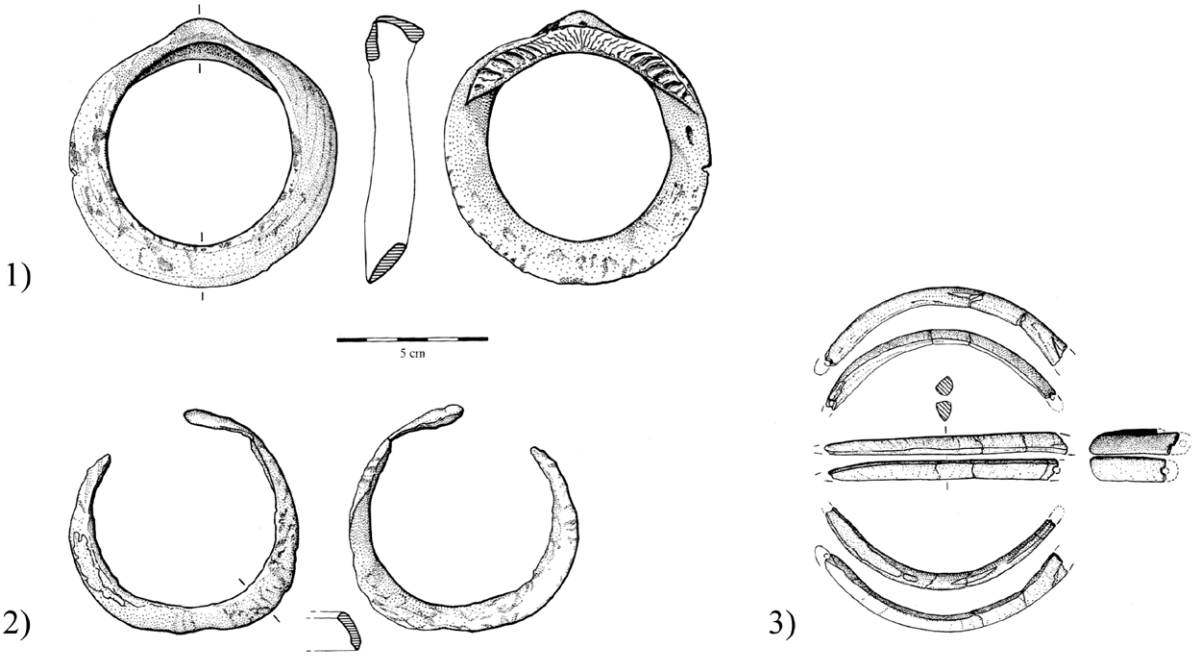


Figure 42: Sion, Chemin-des-Collines. Grave goods: 1) shell bracelet from T9, 2) shell bracelet from T24, 3) two boar tusks from T10 (source: Moinat et al. 2007).

On the basis of the published information, the total of 15 individuals consists of ten adults (three could be determined as male and two as female) and five subadults. Grave goods could only be found within three graves, including two bone tools (awls) and a shell fragment in T11, ochre pigments in T12, and two halves of a Glycymeris seashell in T13 (Moinat et al., 2007, 283–285) (Fig. 44).

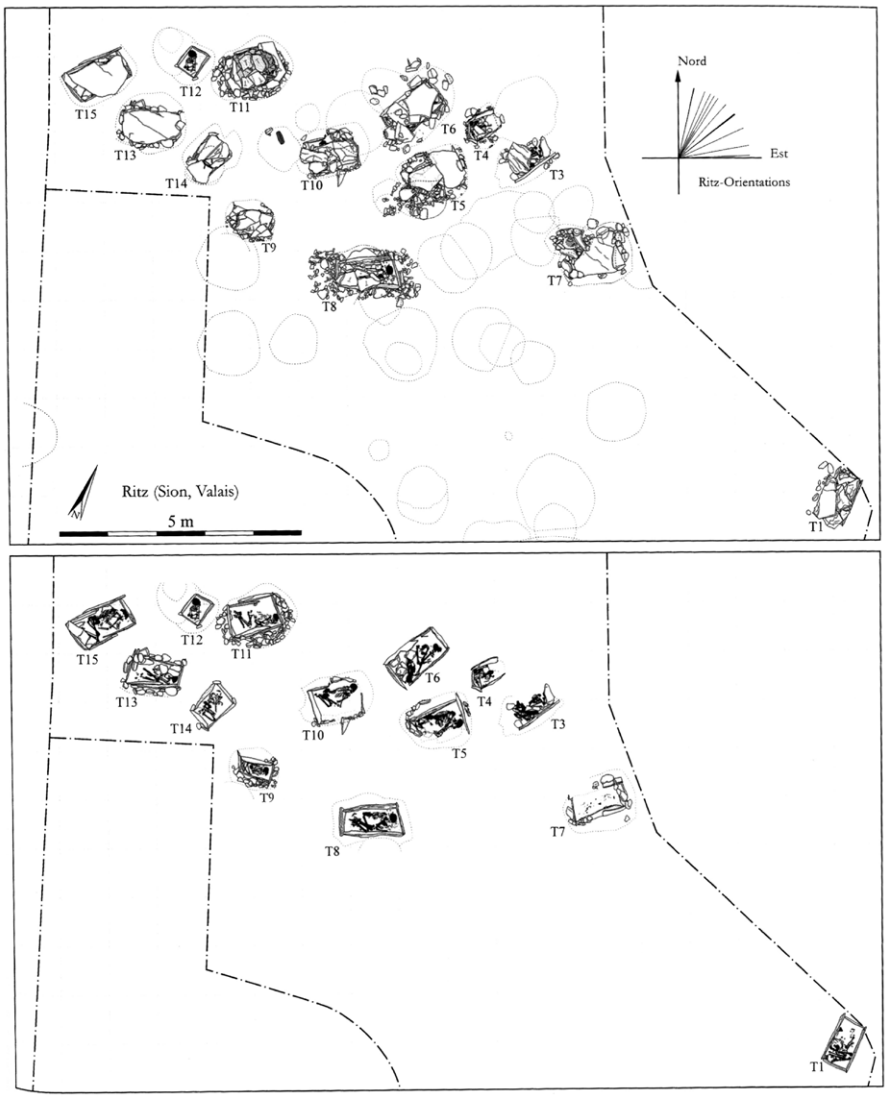


Figure 43: Sion, Avenue-Ritz. Map of the site (source: Moinat et al. 2007).

Sion, Montorge

Overview: In 1951/52, six stone cist graves were discovered during earthworks for a new vineyard on a terrace of the Mont d'Orge, a hill a few kilometres northwest of the old town of Sion (at an altitude of 695 m). Three small stone cists had already been destroyed before the archaeological investigation. The excavated graves (T1–3) were north-south oriented and constructed of four lateral stone slabs and a capstone (the one from T3 weighing over 400 kg) (Figs. 45 and 46.1). Only a few human remains of an approx. 5-year-old individual were found in T1 (Fig. 46.2). The other two graves contained two children between 7 and 13 years old in T2 and three (male?) adults in T3 (Fig. 46.2). These primary burials were in a crouched position on the left side of the body with the head to the north, facing east. No grave goods were noted (Sauter, 1952, 130–138).

Sion, En-Corbassière

Overview: This largely unknown single grave is also located on the hill Mont d'Orge, about 200 m below the stone cist graves of the same name (at an altitude of 520 m). This rectangular stone cist, excavated in 1953, was 125 cm long and 90 cm wide. The bottom of the grave was partially covered with stone slabs, and no capstone was present. The commingled human remains of at least 14 individuals (nine adults and four subadults)

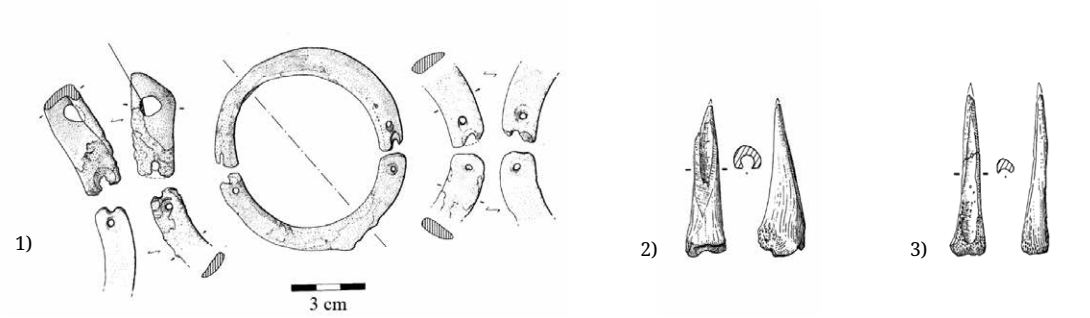


Figure 44: Sion, Avenue-Ritz. Grave goods: 1) two halves of a shell bracelet from T12, 2) and 3) two bone tools (source: Moinat et al. 2007).

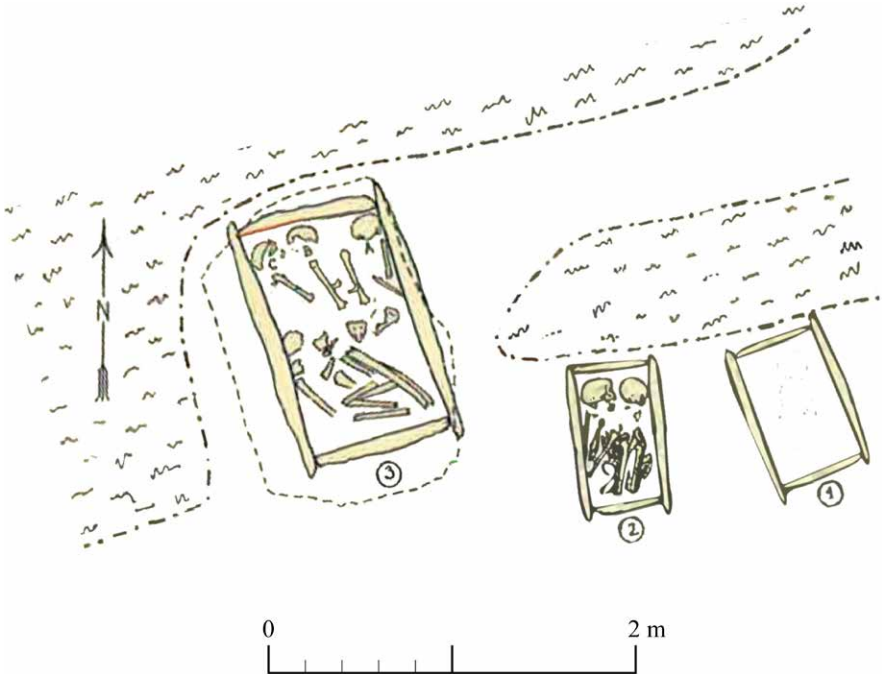


Figure 45: Sion, Montorge. Map of the site (source: Modified by N. Steuri after Sauter 1952).

were found inside the grave (Fig. 47). This cist appears to have been partially emptied before the discovery (Baudais et al., 1990, 13–14; Sauter, 1955, 29). This high number of individuals is remarkable and indicates a collective grave with multiple usage phases and/or secondary burial rituals.

4.4. Lake Geneva, southern shore

The research focus in this zone was centred on the vast necropolis of Thonon-les-Bains, Genevray (Chapter 4.4.1). The only covered outlined site was the single stone cist of Lugrin, Le Petit-Tronc (Chapter 4.4.2) (for the location of sites, see Fig. 5).

4.4.1. Thonon-les-Bains, Genevray

I. Context

This vast necropolis, consisting of at least 220 graves, is located west of the town of Thonon-les-Bains (Haute-Savoie, France) on a plateau (at 457 m in altitude) about 1 km from the southern shore of Lake Geneva.

Figure 46: Sion, Montorge. Selected pictures: 1) top view of grave 3, 2) top view of graves 1 and 2, 3) top view of the capstone of grave 3 (source: © University of Geneva LAP).

II. Background

The site was discovered during road construction works in 2002, and over a 6-month excavation campaign in 2004, a large part of the necropolis was uncovered by the Institut National de Recherches Archéologiques Préventives (INRAP). After the removal of the superficial sediment by a mechanical digger, around 115 stone cists and 29 graves with presumed wooden casting were initially identified on the top level of the Neolithic layers. Under the given circumstances of timing constraints and due to the extent of the necropolis, not all of these graves could be investigated; therefore, it was decided to limit the excavation to the area most affected by the later road construction. A total of 73 graves were subsequently examined in detail, consisting of 59 stone cist graves and 14 pit graves with presumed wooden casting. An additional 28 stone cist graves were recovered as blocks for later analysis and are currently stored in the archive in Annecy (Haute-Savoie France).

In the final stages of the 2004 excavation campaign, it was determined that the graves extended northwards across the previously surveyed area. Therefore, 43 additional graves (six stone cists and 37 pit graves with presumed wooden casting) were uncovered during a short excavation in 2005. Thus, a total of 220 graves were discovered, with 132 stone cists and 88 presumed wooden cists (or simple earth pits). About 120 of these graves could only be superficially documented (Fig. 48) (Baudais, 2007, 156–157).

The stones used for the grave construction consist mainly of slate, although gneiss and other rocks were also used occasionally. The place of origin of these stones was not specifically determined. Considering the massive capstones, the weight does not seem to have been an obstacle to transportation (Baudais et al., 2017, 89). About 540 rock samples were examined petrographically, and these results show an interesting spatial distribution of the stone cists in relation to the raw material used, leading Dominique Baudais to form several groups of graves (Baudais, 2007, 162).

III. Spatial organisation of the necropolis

Based on the geophysical prospection, the investigated area of about 2600 m^2 should correspond to two-thirds of the entire grave site. Towards the north and south, the extent of the necropolis could be identified, but towards the west, it is still uncertain. On the basis of these results, an original rectangular shape can be assumed for the entire necropolis, with an extension of around 65 m by 45 m. A uniform distribution of the graves is recognisable; pit graves with presumed wooden casting are concentrated in the western and northern sections of the necropolis, and stone cists dominate the southern and eastern sections. If an average density of graves is applied to this whole area, the necropolis may have consisted of up to 350 graves (Baudais et al., 2017, 75).

In correlation to the used burial architecture, graves containing 1–2 individuals are mainly found in the northern area of the necropolis, while collective graves dominate in the south. Similarly, greater variability of burial practices is evident in this area, while primary burials dominate in the northern section (Baudais et al., 2017, 133–134). This

Figure 47: Sion, En-Corbassière. Selected pictures: 1) detailed view of the grave, 2) side view of the grave (source: © University of Geneva LAP).

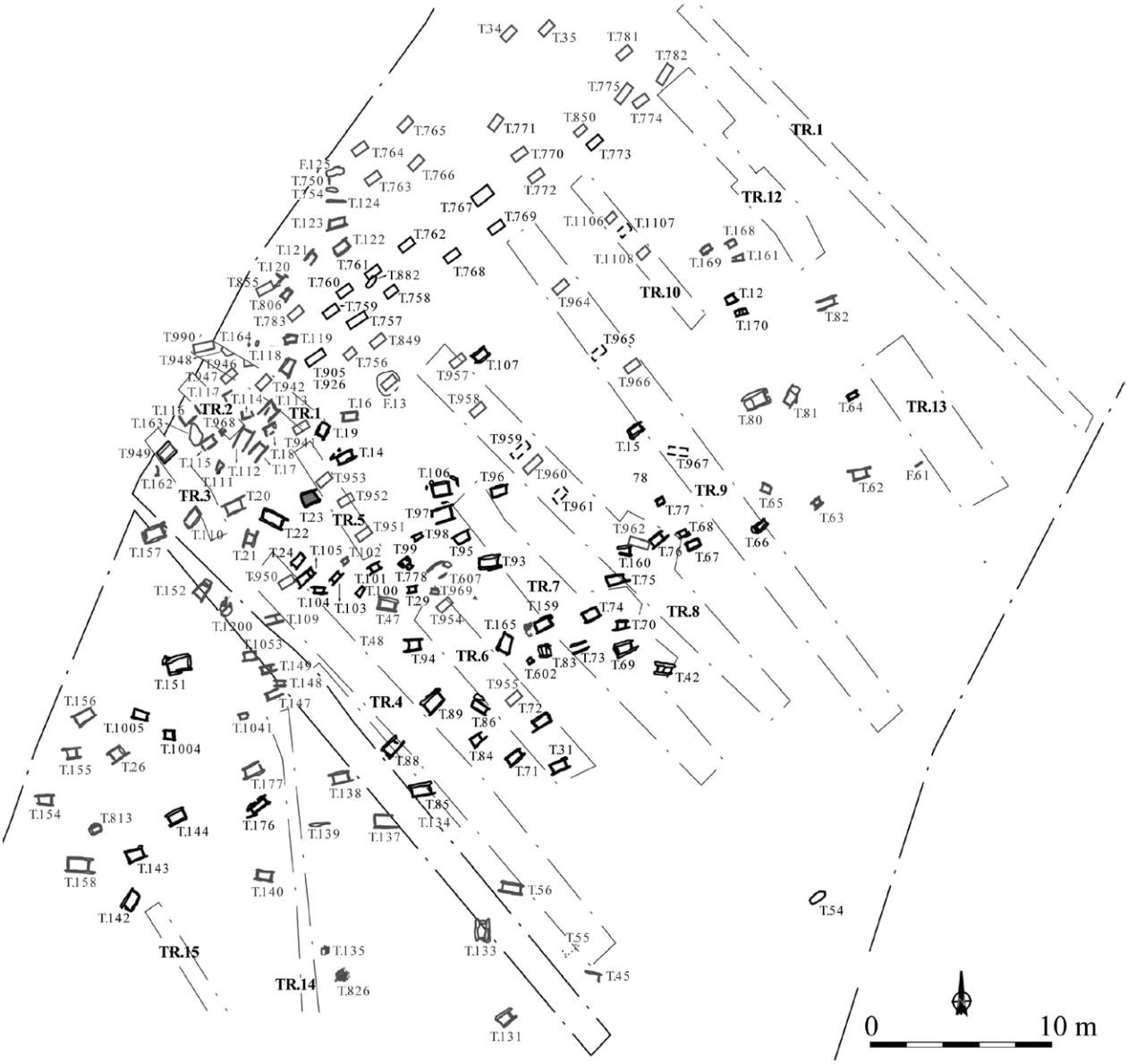


Figure 48: Thonon-les-Bains, Genevray. Map of the site (source: Gatto 2007).

spatial separation is striking and also leads to questions regarding the basis on which the raw material to build specific graves was chosen.

During the excavation, the stratigraphic relationship between the top edge of 85 stone cist graves and the Neolithic ground level could be recognised; the majority of these graves were visible and accessible, as the lateral stone slabs exceeded the level of the grave pits by up to 30 cm. For 25 graves, the top edge of the lateral slabs was at ground level and thus, the capstone was visible. Only 13 stone cists were clearly below the Neolithic ground level and, therefore, probably not visible nor readily accessible on the surface. Regarding the question of possible grave markers on the surface, small upright-placed stone slabs were found around the capstones of graves T66 and T106 (Baudais et al., 2017, 77, 81). The wooden cist graves are assumed to have been constructed in pits. The very homogeneous arrangement and only three documented overlaps of these graves could also indicate the presence of grave markers on the surface. Examples could be detected in the form of smaller standing stone slabs around the grave pits of T941 and T1044. Further, isolated postholes and ditches could represent the remains of grave markers (Baudais et al., 2017, 93–96).

The construction of the stone cists of Genevray does not differ from that of other Chamblandes-type sites. A pit was dug and the lateral stone slabs were placed, forming a rectangular cist. The oval burial pits were generally twice as large as the actual stone cists (this could only be documented for about half of the graves). Almost 70% of the stone cists (n = 92) were formed of four lateral slabs, and 19 consisted of five, and ten of six lateral stone plates. These lateral slate slabs were often worked in a square to trapezoidal shape. The internal dimensions of the stone cists were very variable, between 30 to 140 cm in length and 23 to 90 cm in width. In most cases, the bottom of the pit also formed the grave floor; only in three cases (T55, T71, and T143) was the grave floor paved with smaller, irregular stones (Baudais et al., 2017, 80–82).

About 40% of the stone cists (n = 54) were found with capstones. These were of varying sizes, from small slabs to oversized stone blocks, with eight capstones even exceeding the base of the burial pits (another indication that these were above the Neolithic ground level). Grave coverings consisting of two overlapping stone slabs are rare and only documented for three stone cists (T65, T77, and T83). About ten capstones had a weight of over 1000 kg, and these were found above single burials as well as collective graves. Baudais suspects that these graves could initially have been covered by lighter organic material (wooden lids) during the time of use and only afterwards was the massive capstone placed (Baudais et al., 2017, 87–88).

One notable outlier is the capstone from grave T105 (with the object number us260), as its surface was covered in engravings. They consist of different motifs, such as triangles, serpentine forms, anthropomorphic forms, crosses, and cup-shaped depressions. As the latter often intersect other motifs, the application of these engravings must have been made in several phases. This sandstone slab was originally larger and reworked to cover the stone cist T105. The fracture lines cut through individual motifs, indicating that engravings were made before the slab was used as a capstone (Fig. 49). In addition to this capstone from T105, one other smaller stone fragment from the grave floor of T71 showed an isolated cup-shaped depression (Baudais et al., 2017, 98–99, 654).

Almost 60% of the stone cists were found without a capstone, and there were calcite encrustations at the bottom of many lateral slabs. The analysis of the state of preservation of the human remains further indicates that the latter must have been exposed for a longer period of time. Based on the archaeological features, it can be assumed that these graves were originally also covered. In this context, horizontal covers made of organic material (wood) are rather unlikely, since the construction of the stone cists required a lot of manpower and technical know-how, for steps such as the transport and processing of the stone slabs. Refraining from placing a capstone due to technical difficulties or lack of raw materials is rather unlikely, especially considering that worked stone slabs were used predominantly for subsurface grave construction. It is, therefore, likely that some capstones were removed at later stages (for example, due to agricultural activities [Baudais et al., 2017, 88–89]).

Wooden cist graves: For the “sépulture en pleine terre” (pit graves), numerous archaeological and anthropological features prove the presence of (decayed) casings around the buried individuals. In more than 50% of the burial pits, a change in sediment colour was evident in a rectangular form around the human remains. Further, along the axes of ten graves, narrow grooves were found at the bottom of the pits, which probably served as construction pits to place wooden planks. Larger stone fragments were found on the pit floor in 60 of the 76 excavated sépultures en pleine terre, and it was assumed that these were used to stabilise or wedge wooden planks. In addition to these archaeological findings, osteological observations show that the decomposition of most bodies must have taken place in a hollow cavity, due to the tension or tilting effects of the bones. In eight sépultures en pleine terre, this could not be observed, which is why pit graves without wooden casings for these individuals appear more likely (Baudais et al., 2017, 94).

Figure 49: Thonon-les-Bains, Genevray. Detailed view of the engravings of the capstone from T105 (source: Baudais 2007).

These features indicate that the construction of the so-called wooden cists was mostly similar to that of the stone cists. Instead of stone slabs, wooden planks formed a rectangular cist of 100 to 160 cm in length and 50 to 75 cm in width. The long sides probably partly overhung the cross boards by up to 10 cm. A horizontal wooden covering can also be assumed, while indications of a plank floor are missing. Based on the mentioned grooves at the bottom of the grave, the thickness of the used planks was estimated to have been between 5 and 10 cm (Baudais et al., 2017, 95). With the use of relatively thick planks, the wooden cists might have been preserved long enough for multiple usage phases.

In this context, the grave architecture of the single burial T1044 was interesting, as it combined stone and wood elements. At least 11 stone slab fragments were placed around the lateral sides of a now decayed wooden casting, and a slate slab was placed on top of the wooden cover (Baudais et al., 2017, 126).

Megalithic elements were found not only with respect to the capstones (which weigh up to two tonnes) or isolated stone engravings, but also in the form of a standing stone or stele. This 3.32-metre-long slate stone (designation F.92) has a slightly trapezoidal shape (0.95 m width at the root, 0.7 m width at the top). The presumed upper, narrow part shows a slight ledge about 20 cm below its top. This was addressed as a possible "shoulder", which could reflect the original anthropomorphic character of the stone (Fig. 50).

The probable construction pit for the standing stone (Fs546) had a depth of 0.46 m; thus, the erected stele might have had a height of about 2.6–2.9 m from the Neolithic ground level. It was located among the stone cist graves, in the eastern part of the necropolis. Concerning its spatial positioning, it is remarkable that it stood at the edge of a roughly 5 m wide strip cutting through the necropolis from southwest to northeast, showing no archaeological features and assumed to have been a road or "procession route" (Baudais et al., 2017, 96–97).

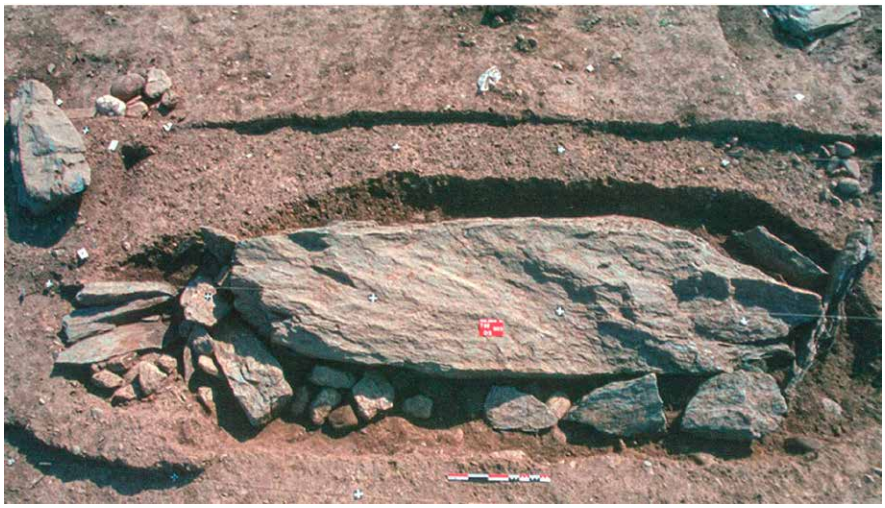


Figure 50: Thonon-les-Bains, Genevray. Top view of the standing stone/menhir (source: Baudais 2007).

It was not possible to determine when the standing stone was erected, as the stratigraphy in this section of the site was disturbed. The stele is made of the same slate stone that was used for the stone cists. This choice of raw material is informative because of the versatile petrographic environment (Baudais et al., 2017, 97). According to Baudais, the stelae must have been placed or toppled in pit F.92 only after the Iron Age (Baudais, 2007, 168–169).

IV. Individual grave description

An account of each grave is omitted here, as these data are listed in the comprehensive, detailed excavation report by Dominique Baudais et al. (2017), and the relevant information for this study is summarised in the subsequent sections.

V. Burial practice

Anthropological evaluation: During the excavation, the aim was to record each burial and to assign the bones to specific individuals. Collective burials were excavated and documented layer by layer. In general, the stone cist graves with intact capstones exhibited better preservation of human remains, while the decomposition of the bones was already advanced for graves without stone cists. Currently, the data from the anthropological evaluation of a total of 68 graves (55 stone cists and 13 wooden cists) are available from the excavation report (Baudais et al., 2017, 99–100).

Due to the poor preservation of most human remains, age and sex determinations were only possible to a limited extent. For example, while the age of most subadults could be estimated, only uncertain determinations are available for eight adult individuals. Furthermore, the sex determination was possible only for 15 adult individuals, consisting of nine males and seven females (Baudais et al., 2017, 142–145). Thus, the available data represent only a small percentage of the burials and do not allow any conclusions in this respect.

Concerning the burial practices, it was determined that adult males, females, and children were treated equally. Clear secondary burials could only be determined for subadult individuals (found in graves T98 and T1004). Also, concerning the "surplus bones", a majority was determined to stem from subadults (found in T14, T69, and T1005) and only one bone found in T24 was from an adult individual (Baudais et al., 2017, 113).

Figure 51 illustrates the age determinations of individuals per collective grave (containing the remains of at least three burials), and Fig. 52 depicts the determined burial practices within these graves.

The individuals were generally placed on the left side of their body or on their back (four were noted laying on their stomach and one or two on their right side), with the

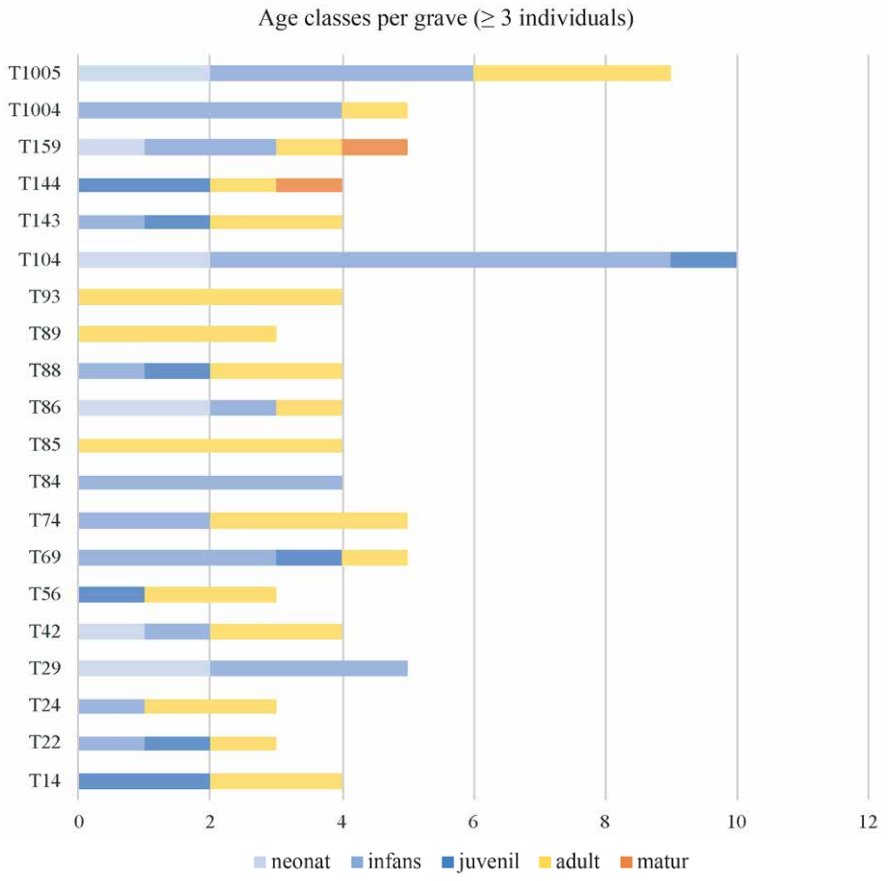


Figure 51: Thonon-les-Bains, Genevray. Graph depicting the age classes of individuals found in graves containing at least three burials.

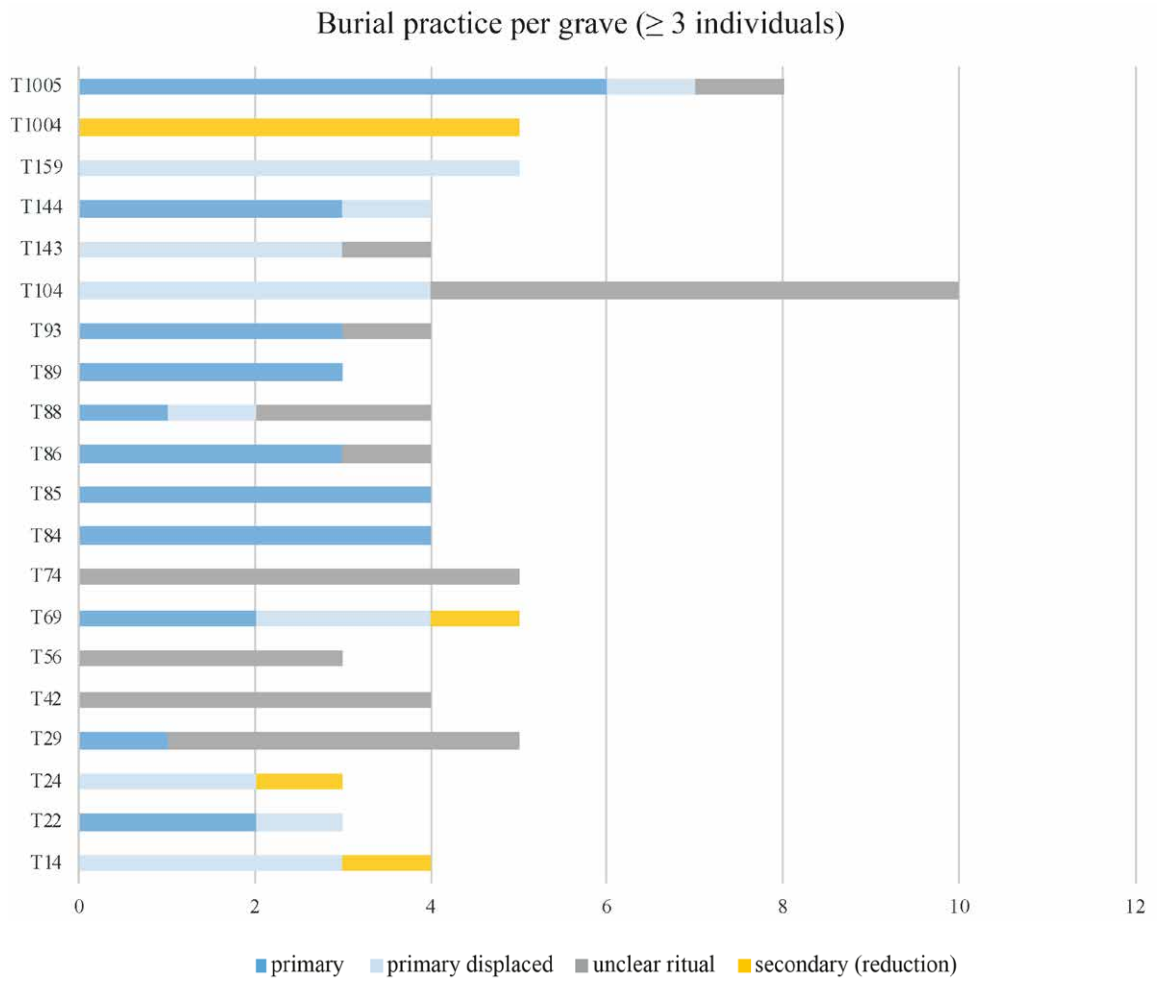


Figure 52: Thonon-les-Bains, Genevray. Graph depicting the burial practices of individuals found in graves containing at least three burials.

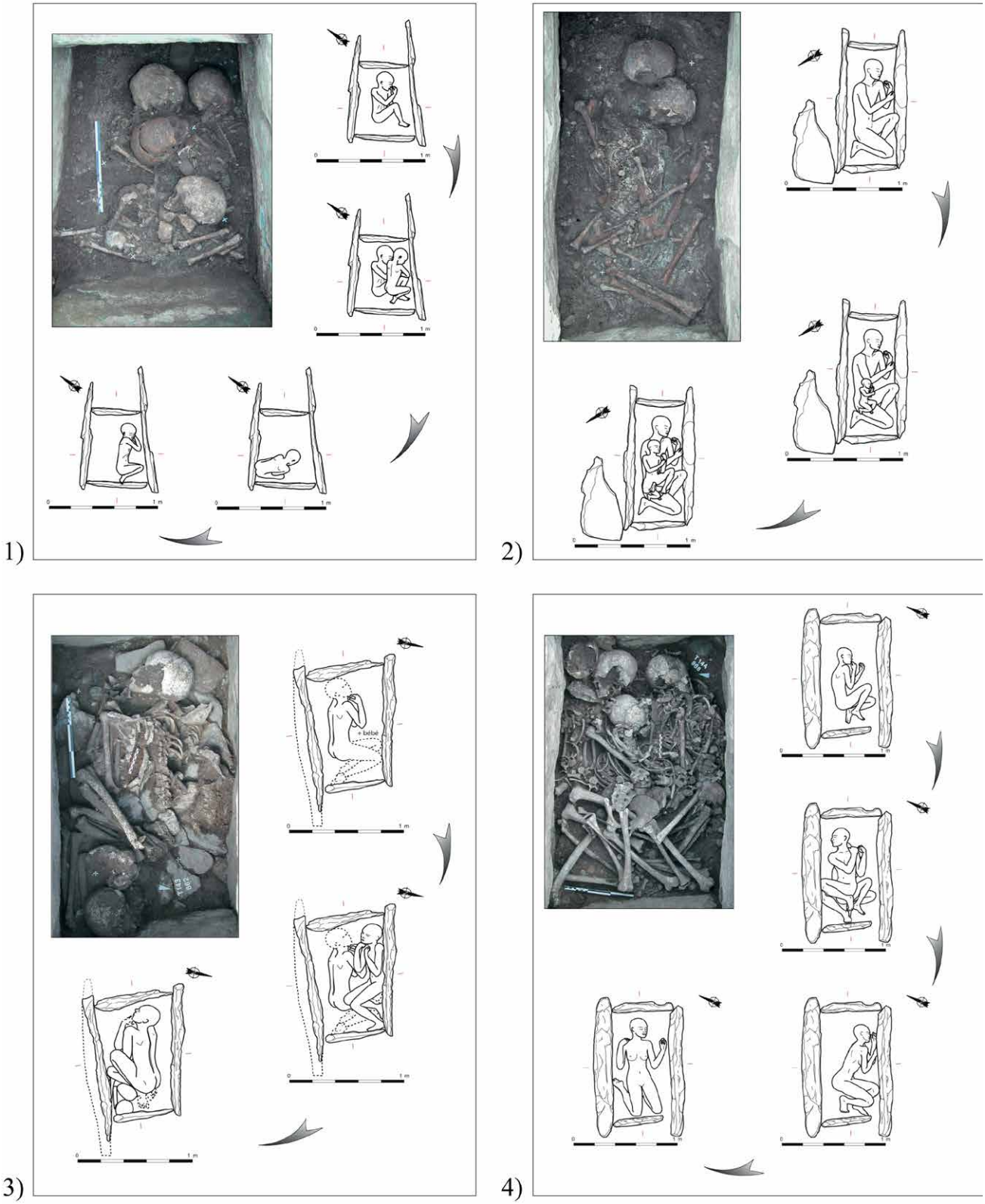


Figure 53: Thonon-les-Bains, Genevray. Top view and sequence of burials from 1) four primary burials from T84, 2) three primary burials and one surplus bone from T86, 3) four primary burials from T143, 4) four primary burials from T144 (source: Gatto 2007).

lower limbs contracted and angled to the left side (with the knees often above pelvic level). The variability in the degree of flexion of the legs was probably also influenced by the space available within the grave. The individuals were mostly oriented with the skull towards the northeast (but, for example, within T143, three individuals were oriented west, Fig. 53.3). This positioning of the deceased was followed for single and double burials. For collective graves, greater variability was evident with increasing numbers of individuals per grave (Baudais et al., 2017, 90).

Burials in stone cist graves: A great variability of burial practices was found within the 55 analysed stone cist graves. Similar to the anthropological evaluation of Esther Gatto, these are summarised according to the number of individuals per grave. Determining the MNI was problematic at times, especially concerning single "surplus bones" and/or secondary burials probably originating from other graves.

Single burials: 23 graves (42%) contained remains of only one individual; however, Gatto identified only 13 stone cists as clear single burials (of two adult males and females and nine minors), as the poor state of preservation of bones within ten graves did not allow a thorough anthropological evaluation. Primary burial practices were suggested for most of these graves. For T98, a secondary placement was suggested, because the arrangement of the bones indicates a deposition in a square container (probably of organic material). In this context, the bones from the individual in Tomb T31 also appeared to have been secondarily displaced, and the absence of long bones suggests the deliberate removal of certain skeletal elements (similar practices were suggested for graves T77 and T160 (Baudais et al., 2017, 102–104).

In 12 stone cists (22%), the human remains of two individuals were found. A simultaneous burial was only suggested for graves T106 and T142. For the other graves, it seemed likely that the remains of a centrally placed individual were displaced to make room for the burial of a second individual. Exceptions to this practice were detected, for example, within T55, where a single molar of an adult individual was found next to the primary burial of a child. It is unclear whether this tooth represents a grave good, secondary burial, or maybe the remnant of an older, mostly removed burial in this stone cist. Further, a unique feature for this necropolis was documented within the stone cist T97, where a 5–10 cm thick sediment layer was put over a single primary burial and, afterwards, the remains of a second individual were placed on top of this separating layer (Baudais et al., 2017, 104–106).

The remains of three individuals were found in four graves (7%). A simultaneous burial is only likely for the three adults found in T89, since the skeletons were placed side by side and their legs probably (partially) interconnected. An interesting practice was observed within the stone cist T24, where the primary burials of an adult and a 5- to 8-year-old individual were moved to the sides to place a single left femur (Baudais et al., 2017, 106–107).

A total of nine graves (16%) contained the remains of four individuals, typically consisting of successive primary burials. In this regard, prior to the placement of another individual, the remains of the preceding burials were displaced and probably also partially removed. However, disturbances of bones, even after the last burial, were noted and probably related to specific burial rituals of opening and removing skeletal elements. Three stone cists (T14, T85, and T86) contained the remains of three primary burials and one surplus bone (of a fourth individual). For example, at grave T86, two subadult individuals were placed over the remains of an adult female, and an additional femur of a newborn was found alongside them on the grave floor (Baudais et al., 2017, 107–109) (Fig. 53).

Finally, the remains of five to ten individuals were found in seven stone cists (13%). Once more, prior to the placement of another individual in these collective graves, the remains of the preceding burials were displaced and partially removed to make room. These multiphase actions could be observed at grave T104, where no skeleton of the total of ten burials was fully present and two individuals are only represented by one

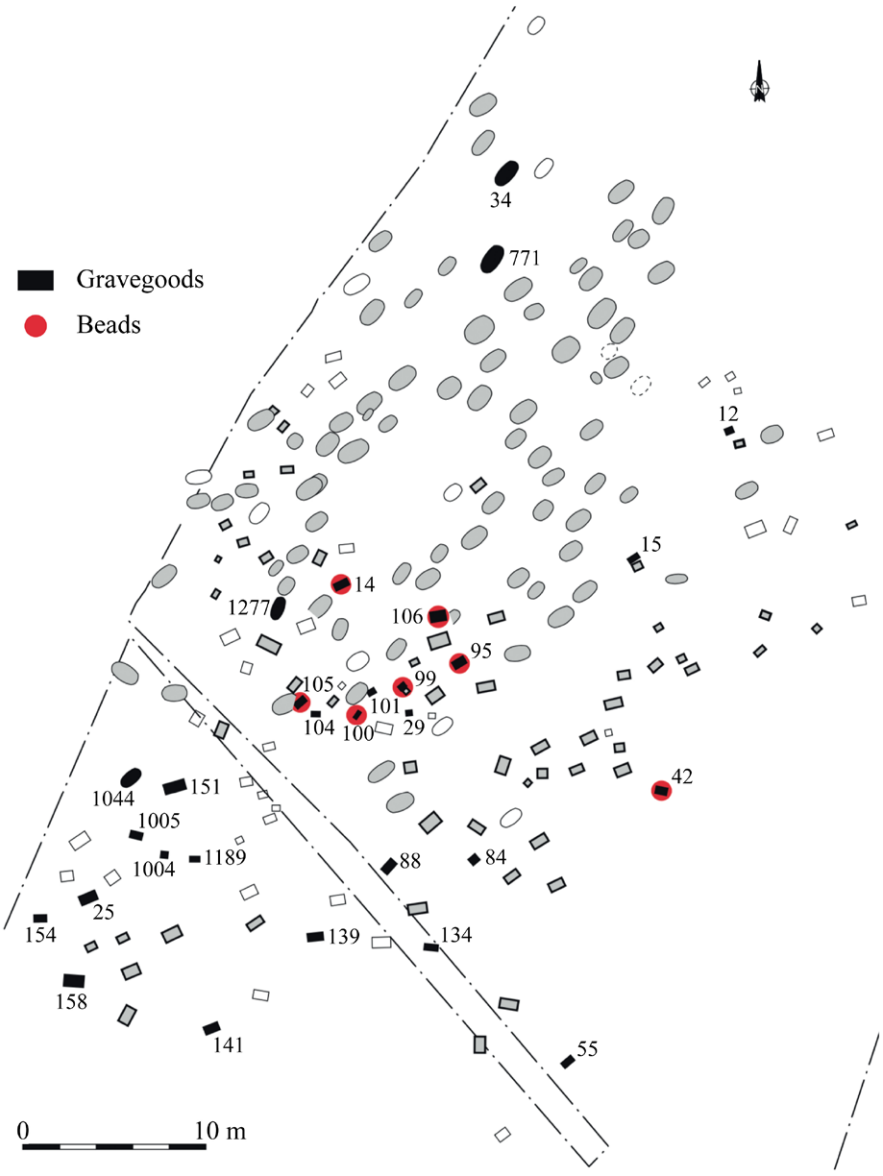


Figure 54: Thonon-les-Bains, Genevray. Map of the site indicating graves with grave goods (source: Baudais 2007).

tooth. Additionally, the skulls were grouped together in the southwest corner of this stone cist. Evidence of secondary burial practices was observed within grave T1004, with the successive or simultaneous placement of single skeletal elements of five individuals (Baudais et al., 2017, 110–111).

Burials in wooden cist graves: With few exceptions, the 13 anthropologically analysed wooden cists contained primary single burials. Only grave T761 was addressed as a probable simultaneous burial of two individuals. Two other wooden cist burials (T946 and T947) turned out to be primary single burials with the scattered remains of another individual. For these graves, termed "sépulture double avec réduction", it is suspected that the bones of an older burial were moved and partially removed. This suggests that these wooden cists must have still been functional at the time of the burial of the second individual (Baudais et al., 2017, 95–96). The question arises whether these scattered bones actually represent secondary burials or if they were deposited in the wooden cist at the same time as the primary individual.

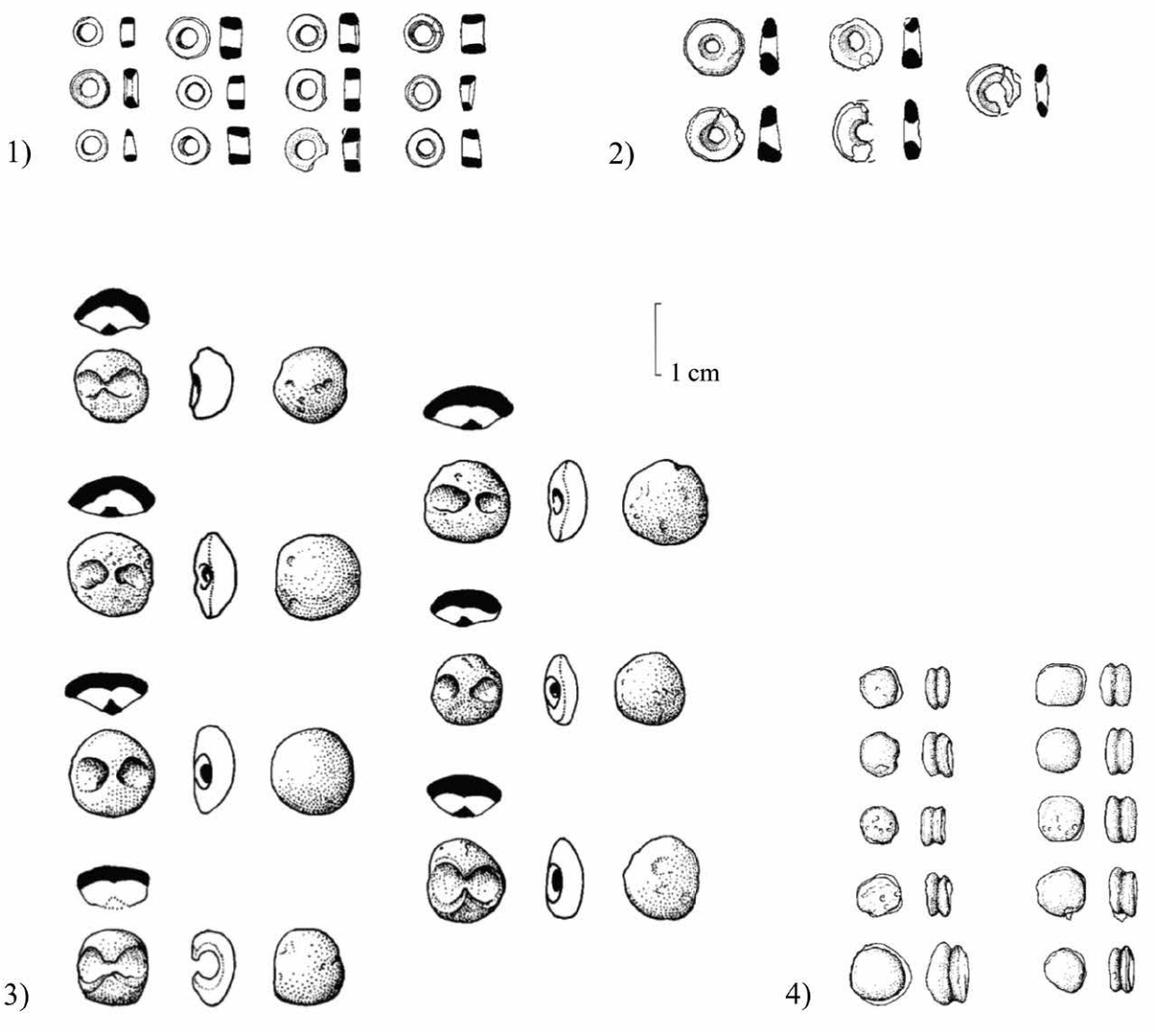


Figure 55: Thonon-les-Bains, Genevray. Different beads from T95: 1) jet disc beads, 2) limestone disc beads, 3) Glis-type buttons, 4) Doppelknöpfe (source: Baudais et al. 2017, © D. Baudais - INRAP).

VI. Grave goods

Baudais mentioned that such objects could only be detected within 29 of the 153 excavated graves (Fig. 54). These consist almost exclusively of stone cists (n = 25), as only four graves with wooden casings contained grave goods (Baudais et al., 2017, 154). Detailed information regarding grave goods is only available for 27 graves and is covered here. The most common types are ornamental elements made of stone, animal bone, or seashells, while worked stone objects and pottery fragments could be found only sporadically. Due to the problem of collective burials, an assignment of finds to certain individuals is omitted here, except in presumably clear cases (e.g. primary single burials). In the following register, the recorded grave goods are presented as broad types:

- Ornamental stone objects: About 1350 beads made of jet were found within the five graves T42, T95, T105, T106, and T1277. These objects have a uniform disc shape of 3.6–6 mm in diameter and 1.5–4 mm in thickness, with a central perforation of 2–3 mm in diameter. Further, 75 disc beads made of limestone originate from T95, T100, and T106. These are comparable to the objects made of jet but are slightly larger, with a diameter of 7–9 mm. Two other graves (T141 and T158) also yielded tubular limestone pendants, each 11 mm long. Two types of objects

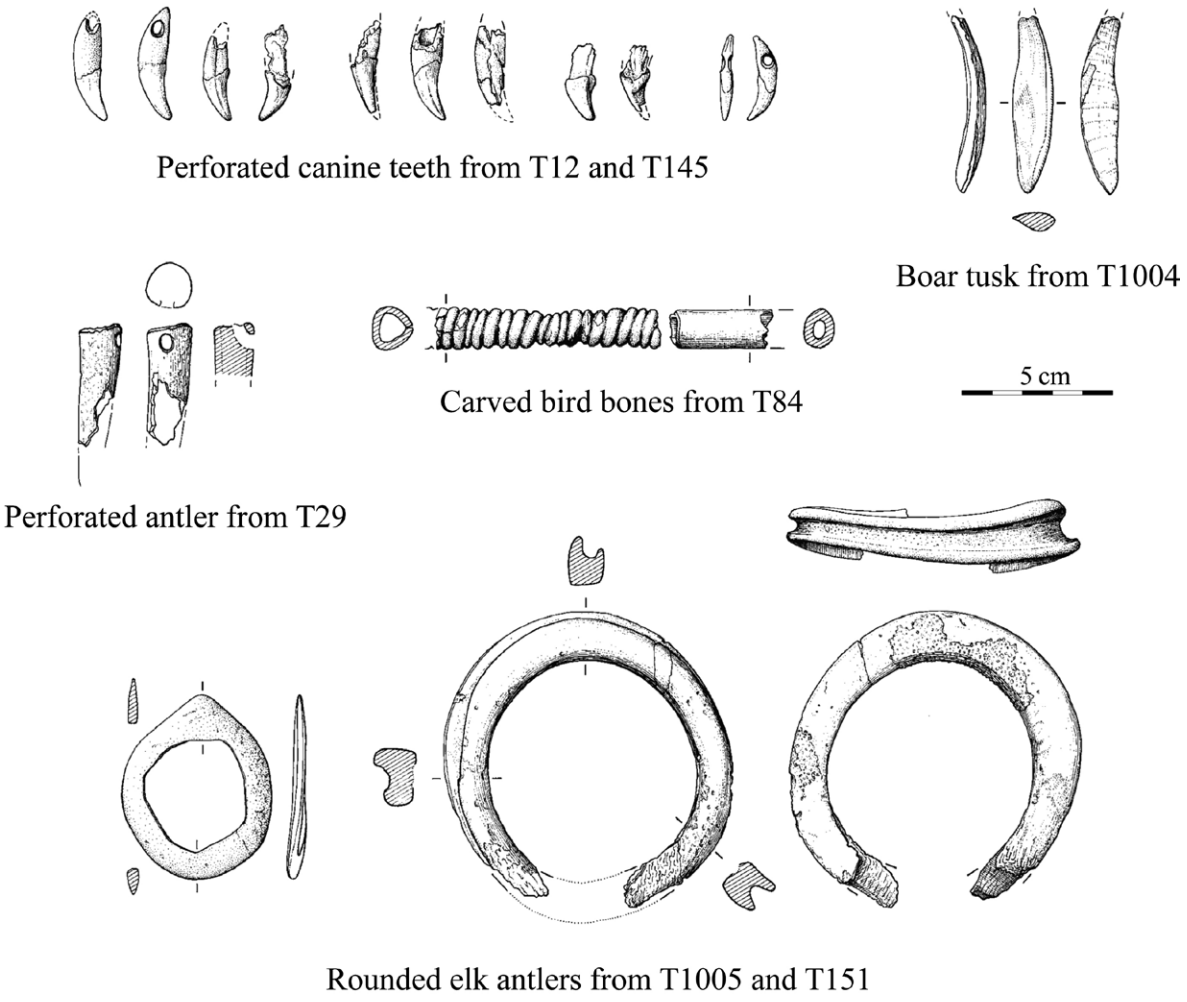

Perforated canine teeth from T12 and T145
Boar tusk from T1004
Carved bird bones from T84
5 cm
Perforated antler from T29
Rounded elk antlers from T1005 and T151

Figure 56: Thonon-les-Bains, Genevray. Different ornamental objects made of animal bone, teeth, or antler (source: Baudais et al. 2017, © D. Baudais - INRAP).

were exclusively found in grave T95: seven so-called buttons of the Glis type and 42 "Doppelknöpfe". The Glis type denominates roundish limestone objects with a diameter between 9.5 and 12 mm, with a convex back surface and flattened front with two V-shaped perforations (from the edge to the centre of the object), while "Doppelknöpfe" are rounded, disc-shaped limestones of 5–9 mm diameter with a circumferential groove on the narrow side. A triangular nephrite object with rounded edges was found in T818. It is 52 mm long and exhibits two central, small perforations next to each other (Baudais et al., 2017, 157–158, 350) (Fig. 55).

- Ornamental objects made of animal bone, teeth, and antler: Two rounded pieces of elk antlers found in graves T151 and T1005 are assumed to be imitations of Glycymeris seashell bracelets, as the object from T151 was found on the forearm of the skeleton (Baudais et al., 2017, 156). Two graves yielded animal teeth pendants: a set of seven canine teeth (six from dog/wolf, three from lynx, and one from fox), three of which have a preserved perforation. Further, a single perforated tip made of deer antler was found in grave T29. A fragment of a halved boar tusk showing polishing traces originated from grave T1004, and three unique fragments of a tubular bird bone with about 20 carved spirals were found in T84 (Baudais et al., 2017, 155–157, 348) (Fig. 56).
- Ornamental seashell objects: Two fragments of a Charonia nodifera were found in graves T95 and T101. These 5 cm long objects were in a bad state of preservation and originally had (at least) one perforation. Five small beads of perforated Columbella rustica shells were found in T134 and another in T1189. Two tubular beads of

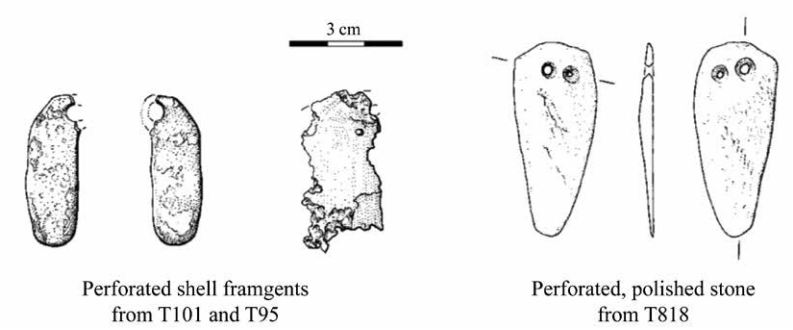


Figure 57: Thonon-les-Bains, Genevray. Seashell and stone objects (source: Baudais et al. 2017, © D. Baudais - INRAP).

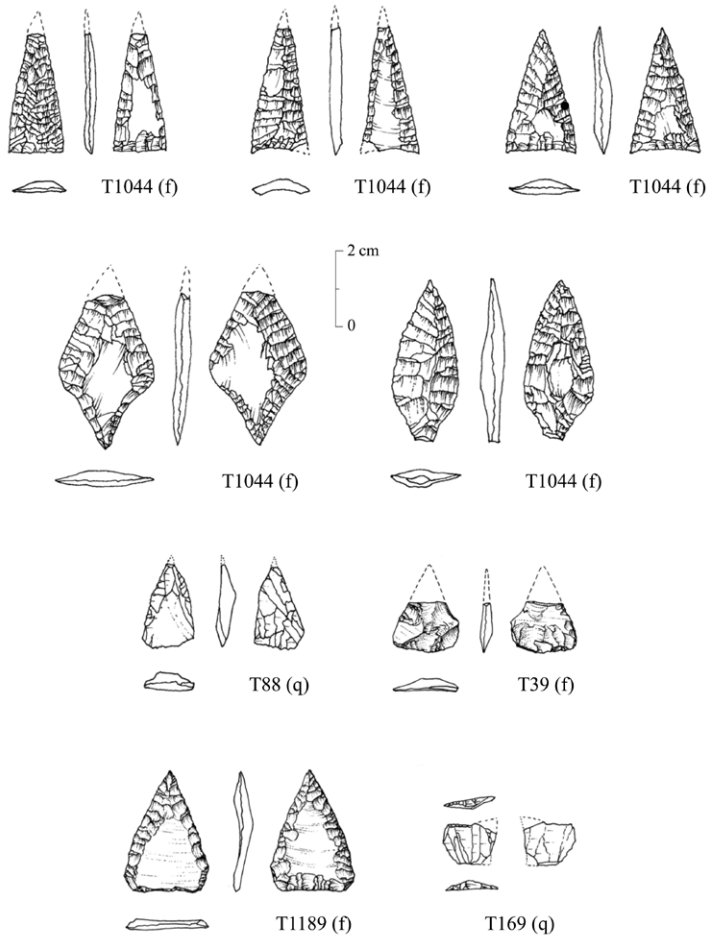


Figure 58: Thonon-les-Bains, Genevray. Different arrowheads made of flint (f) and quartz (q) (source: Baudais et al. 2017, © D. Baudais - INRAP).

Dentalium originate from grave T15 and an undetermined shell fragment was found in T141 (Baudais et al., 2017, 158–159, 350) (Fig. 57).

- Stone and rock crystal tools: A total of seven flint arrowheads were found in three graves: one in T139, one in T1189, and five poorly preserved specimens in T1044 (three with a triangular form, one diamond-shaped, and a fifth with a short stem). An object of rock crystal from grave T88 was addressed as a triangular arrowhead with a concave base, and another rock crystal fragment from T169 showed traces of processing (Baudais et al., 2017, 161–168, 354–355) (Fig. 58).
- Pottery: Ceramic fragments were only found within two graves, indicating a round-bottomed bowl in T55 and a small bag-shaped pot with two handles in T139 (Fig. 59).

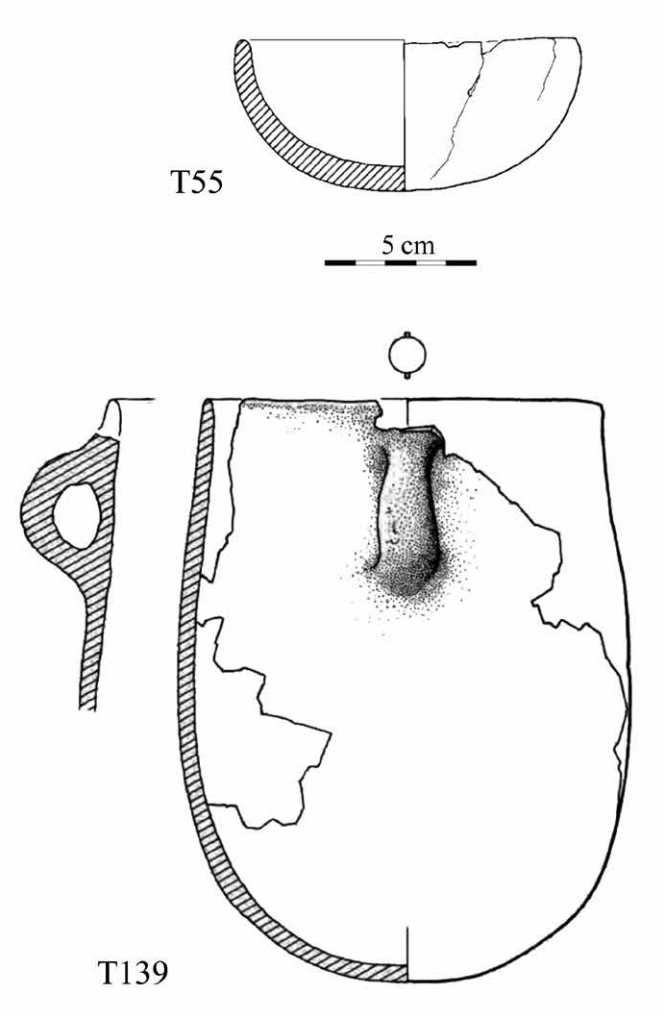


Figure 59: Thonon-les-Bains, Genevray. Ceramic vessels from the graves (source: Baudais et al. 2017, © D. Baudais - INRAP).

- Necklace from grave T95: With more than 800 objects of four types of beads, the burial in T95 was unique to this necropolis. Based on detailed documentation during the excavation, it could be determined that many of the found beads were originally part of an intricate double-rowed necklace, where bright-coloured limestone beads lay between longer sequences of dark-coloured jet disc beads, while 12 limestone beads were grouped together on the presumed front side (at the chest area of the buried individual). The Glis buttons and "Doppelknöpfe" exclusively found within this grave T95 were recovered under the skull and chest area of the individual and may have been sewn onto the clothing (Baudais et al., 2017, 159–160).

4.4.2. Outlined site

Lugrin, Le Petit-Tronc

Overview: The site was located on the road Petit Tronc, about 100 m south of the shore of Lake Geneva in the municipality of Lugrin (Haute-Savoie, France), around 15 km east of Thonon-les-Bains. A single stone cist grave was discovered and subsequently destroyed in 1971. The only documentation available is a short police report with two photographs (Fig. 60). Apparently, the grave consisted of four thin lateral stone slabs with a capstone and was 105 cm long and 55 cm wide. In the pictures, (at least) two skulls are recognisable and three perforated seashell objects were mentioned as grave goods (Combier, 1980, 522–523).

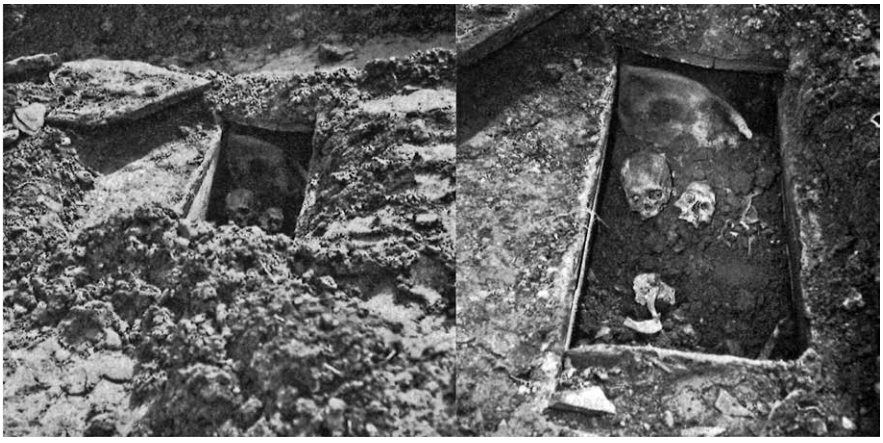


Figure 60: Lugrin, Le Petit-Tronc. Pictures of the grave during the discovery (source: Combier 1980).

4.5. Lake Geneva, northern shore

The research focus in this zone was centred on the necropolis of Corseaux-sur-Vevey, En-Seytion (Chapter 4.5.1). A summary is given of the available data from the sites of Pully, Chamblandes, and Lausanne, Vidy (Chapter 4.5.2) (for the location of sites, see Fig. 3).

4.5.1. Corseaux-sur-Vevey, En-Seyton

I. Context

The site, consisting of over 20 cist graves, is located on the meadow "En Seyton" in the municipality of Corseaux (Vaud, Switzerland) and is about 3 km west of the city of Vevey (Vaud, Switzerland). The necropolis is situated around 200 m north of the shore of Lake Geneva at the southern foot of the Mont Pèlerin ridge. The terrain in this area was probably a natural terrace during the Neolithic period, but today, the colluvium of the slope and terracing for vines cover the northern area of the necropolis.

The detailed analysis of this site was published by Dominique Baudais (archaeological context) and Christiane Kramar (anthropological investigation) in 1990. Additionally, an up-to-date overview concerning the human remains of this necropolis was provided in the recent PhD thesis by Claudine Abegg on the health profile of the Neolithic population of western Switzerland (Abegg, 2019).

II. Background

During construction work in 1965, three stone cist graves (named 65-T1 to 65-T3) were discovered at the site. Their documentation was insufficient due to the relatively short rescue excavation. Similarly, only a part of the skeletal remains and the archaeological finds of these graves was recovered.

Around 50 m west of these first three graves, another stone cist (T1) was discovered during construction work in spring 1973. This stone cist had already been disturbed by the foundation walls of a neighbouring building and was therefore excavated on site. Based on this discovery, the subsequent mechanical excavation, around 6 m west of T1, was accompanied by the archaeological unit of the canton of Vaud MHA (Monumentes Historiques et Archéologiques de l'état de Vaud). In this context, 13 additional graves (T2–14) were found, and 5–10 additional stone cists might have been destroyed when an area of several dozen square metres north of T1 was excavated by the construction company without the knowledge of the MHA. Based on soil discolouration, two graves (T19 and T21) could still be located within this zone, and eight other stone cists (T15–T18 and T21–T24) were identified in the profile sections (Fig. 61).

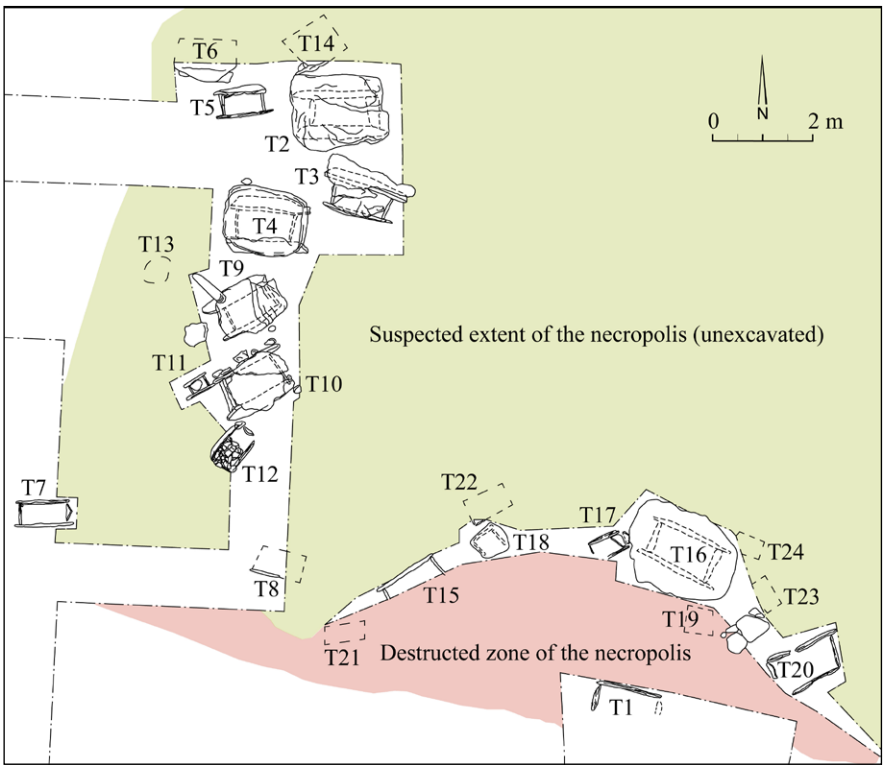


Figure 61: Corseaux-sur-Vevey, En Seytion. Map of the site (source: N. Steuri after Baudais and Kramar 1990).

During this excavation campaign between summer 1973 and spring 1974, 12 graves were recovered as blocks; first, the surrounding sediment was removed, the stone cists were then protected by a layer of plaster together with an occasional wooden boarding, and finally, lifted and transported. Due to their bad condition and time constraints, four stone cist graves (T1, 4, 9, and 16) were dissected directly in the field. The other graves suspected to be on the site were not excavated, since they were not directly threatened by the construction work (or had already been destroyed by it).

During exploratory excavations in spring 1981 northeast of the investigated areas of 1965 and 1973/74, no further graves were discovered and the Neolithic layer (Layer 2) could only be investigated sporadically (Baudais and Kramar, 1990, 12–13).

The stratigraphy of the site was documented on two profiles crosscutting the necropolis, and subsequently divided into four layers (Baudais and Kramar, 1990, 22):

- Layer 0 is the topsoil, with a thickness of 10 to 35 cm.
- Layer 1 consists of brown silt with pebble stones and modern ceramic fragments. In the northern part of the necropolis, this layer has a thickness of 130 cm, while in the south, it is barely 40 cm. In the west, it lies directly on Layer 3. It was interpreted to be redeposited sediment associated with terracing for vine cultivation.
- Layer 2 is a gravel level of yellow-brown colour with numerous charcoal fragments. It extends over the entire site, with an irregular thickness of 13 to 45 cm. This level contains the burial pits (cut into Layer 3) and stone cist graves. Additionally, the Neolithic surface level is estimated around 10 to 15 cm above the lower edge of Layer 2.
- Layer 3 summarises a sequence of sand and gravel layers. These are deposits of the Rhône glacier. It is evident from the profile drawings that the floor of the stone cist graves lies on Layer 3.

III. Spatial organisation of the necropolis

The extent of the necropolis is estimated to have been around 45 m by 25 m; the three graves of 1965 delimit the eastern extent of the site, and T7 represents the westernmost

stone cist. No grave could be detected south of T1, and, during the exploratory excavation in 1981, the northern extent of the Neolithic layer was found (Baudais and Kramar, 1990, 26–27).

Regarding the spatial distribution and orientation of the graves, Baudais suggested that the stone cists were arranged into three groups, with the respective graves never being apart more than 70 cm (Baudais and Kramar, 1990, 27):

- The first, in the northwest of the necropolis, consisting of graves T2 to T6 with an east-west orientation.
- The second, identified further south, consisting of graves T9 to T12 with a north-east-southwest orientation.
- The third, in the south of the necropolis, T6, stands out with its northwest-southeast orientation, surrounded by four smaller stone cists (T17, 19, 23, and 24).

The stone cist graves could also be divided into three groups based on their dimensions: small cists under 40 by 35 cm (T11, 17, and 18), narrow cists under 50 cm in width (T5, 7, and 12), and large cists with a length of over 95 cm and width of over 55 cm (T1–4, 9, 10, 15, 16, and 20; Baudais and Kramar, 1990, 33).

The construction of the stone cists does not differ from that of other Chambland-es-type sites, as lateral stone slabs forming a rectangular cist were placed in a narrow and steep pit. With the exception of graves T7 and T20, capstones could still be found in situ on all stone cists. The material used was sandstone from the surrounding Mont Pérlin. Open gaps between the irregular side slabs were sealed with smaller stone fragments. Additionally, pebble stones at the base of the lateral slabs served to wedge and stabilise the stone cists (Baudais and Kramar, 1990, 30–33).

For a majority of the graves, it was observed that the capstone was around equal height to the lower edge of Layer 2. Other graves (T12 and 14) were constructed in a relatively deep pit, and the capstone was originally covered by sediment. During the excavation, it was noted that the graves or burial pits were probably not visible on the Neolithic surface level (in Layer 2). In this context, a cylindrical stone (82 cm in length and 20 cm in diameter) was found above the capstone of T9 at about the Neolithic surface level (Baudais and Kramar, 1990, 28–29). This is interpreted as a small standing stone to mark the location of the grave, and similar features were observed at the sites of Wettingen and Pully.

IV. Individual grave description

An account of each individual's grave is omitted in the current study, as these data are listed in the detailed publication by Baudais and Kramar (1990). The relevant information for this study is summarised in the subsequent sections.

V. Burial practice

The individuals were generally placed on their left side. Only one burial from T16 was found in a dorsal position, and one from T9 in a ventral position. The lower limbs were contracted with different levels of flexion from the knees at the level of the pelvis up to the level of the chest. The arms were usually flexed, or, in some cases, crossed over the torso (T9 and 16) or extended along the body (T10). The direction of view was generally towards the south.

Anthropological examination: On the basis of features on the skull, mandible, pelvis, and femur, Kramar determined the sex of 26 adult individuals, consisting of 15 female and 11 male individuals. The age at death was determined for 42 individuals based on the combined indicators of the cranial sutures, the pubic bone, and humeral and femoral epiphyses (Baudais and Kramar, 1990, 89–92).

As part of her PhD thesis, Claudine Abegg was able to re-examine a total of 1998 bones from this necropolis. About a quarter of the bones (25.13%) were identified as complete (meaning that 95–100% of the original bone was still present), 58.01% were incomplete

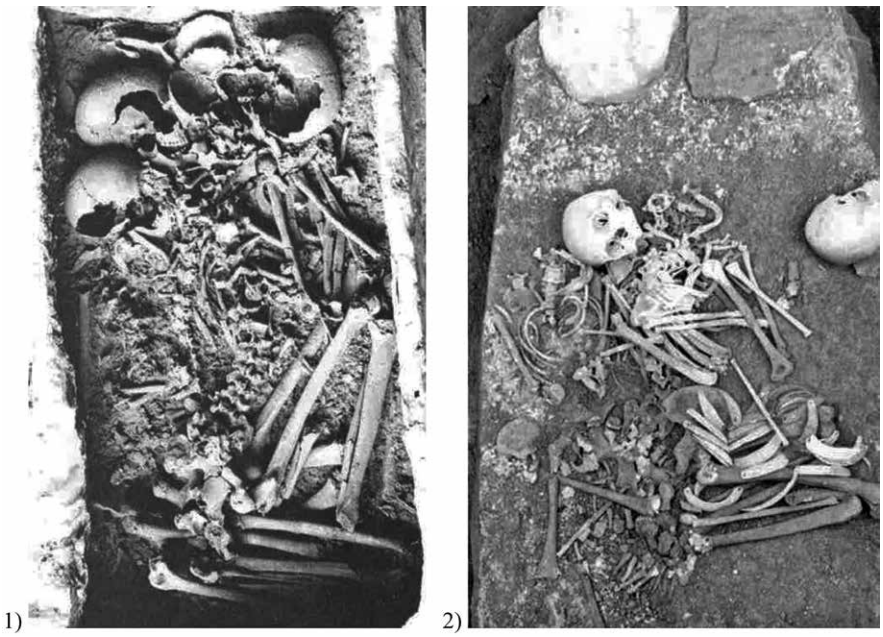


Figure 62: Corseaux-sur-Vevey, En Seytion. Selected pictures: 1) top view of the six primary burials of T3, 2) top view of the human remains and perforated boar tusks from T4 (source: Baudais and Kramar 1990).

(50–95% of the bone present), and the remaining bones were fragmented (<50% of the bone present). The skulls are relatively well preserved and give an MNI of 45. The skeletons of around 40 individuals could be identified, while unidentifiable or unassignable bones were summarised under the term "VRAC". For almost half of the 40 individuals (n = 17), no age or sex determination was possible. The remaining individuals consisted of 12 adults and 11 subadults (three neonates, six infants, and two juveniles). Of the adult individuals, seven could be determined as male and four as female (Abegg, 2019, 174–176).

In total, the human remains of at least 48 individuals were reported within 17 stone cists, resulting in an average of 2.8 individuals per grave. Graves containing the remains of only one individual (n = 4) appear to have been exclusive to subadults. Additionally, these single burials seemed to be grouped around a larger collective stone cist grave. A total of eight stone cists contained the remains of at least three individuals, and most were found in T15 with an MNI of seven. For these collective graves, it was observed that the presumed final burial was placed directly on top of the individuals previously deposited in the cist, partially disturbing their remains (e.g. Fig. 62.1). For at least three cases (T4, 7, and 15), it was evident that the previous human remains were clearly moved to the side to make room for a new burial (also indicating an advanced decomposition stage for these older burials). No clear evidence for secondary burials can be observed within this necropolis.

VI. Grave goods

Grave goods were found within only nine of the stone cists, and the majority of these are ornamental objects, which are almost exclusively associated with female individuals (except in grave T7, where jet beads were associated with males).

- Ornamental stone objects: Approximately 250 jet disc beads were recovered from four graves: eight in T1, 28 in T4, 75 in T5, and 131 in T7. Exclusive for T1 were 97 disc beads made of limestone and 26 Glis buttons (Baudais and Kramar, 1990, 40–41) (Fig. 63).
- Ornamental objects made of animal bones, teeth, and antler: A total of 31 boar-tusk fragments were found in grave T4. They were halved boar tusks, which were cut longitudinally and their edges and inner surfaces ground and polished. These objects were perforated at both ends, with five specimens showing double perforations, probably due to premature breakage of the original perforation. These boar-tusk

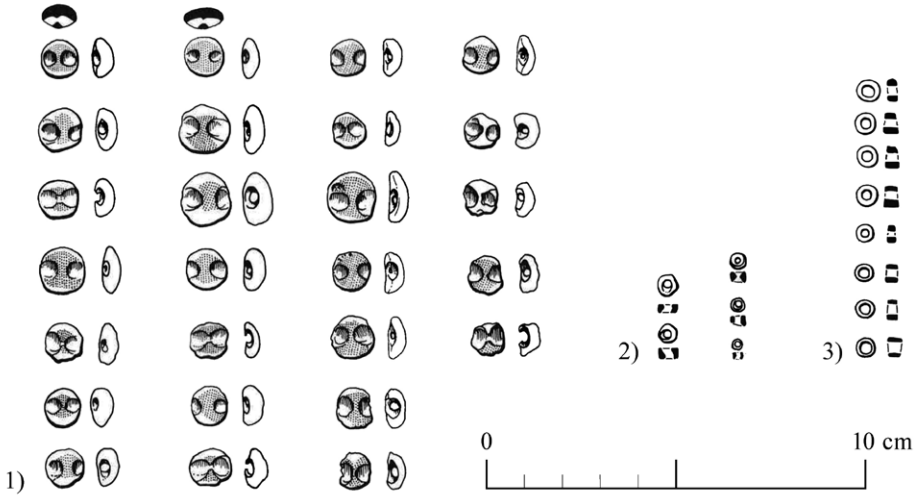


Figure 63: Corseaux-sur-Vevey, En Seytion. Different beads from various graves: 1) Glis-type buttons, 2) limestone disc beads, 3) jet disc beads (source: Baudais and Kramar 1990).

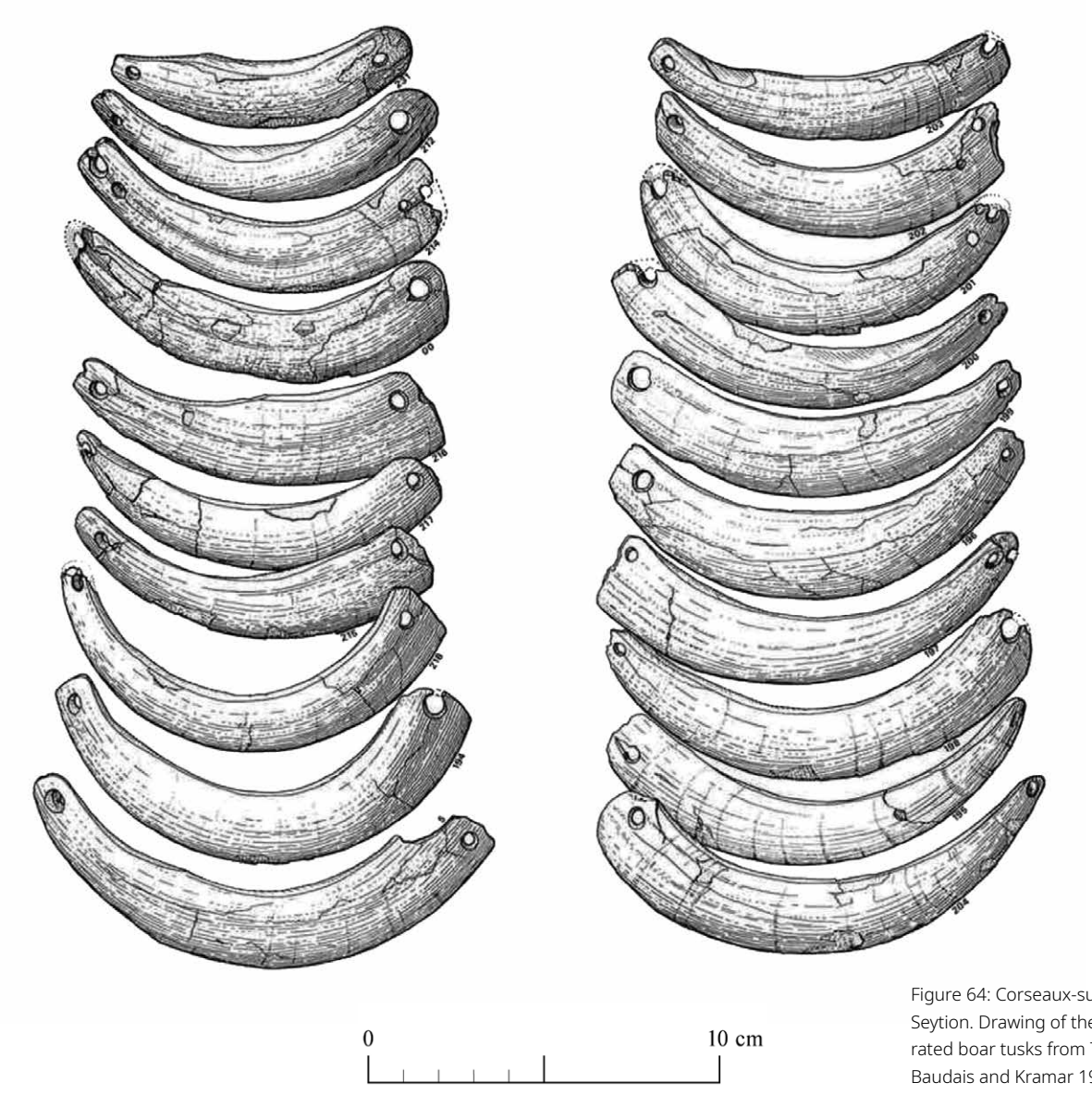


Figure 64: Corseaux-sur-Vevey, En Seytion. Drawing of the 31 perforated boar tusks from T4 (source: Baudais and Kramar 1990).

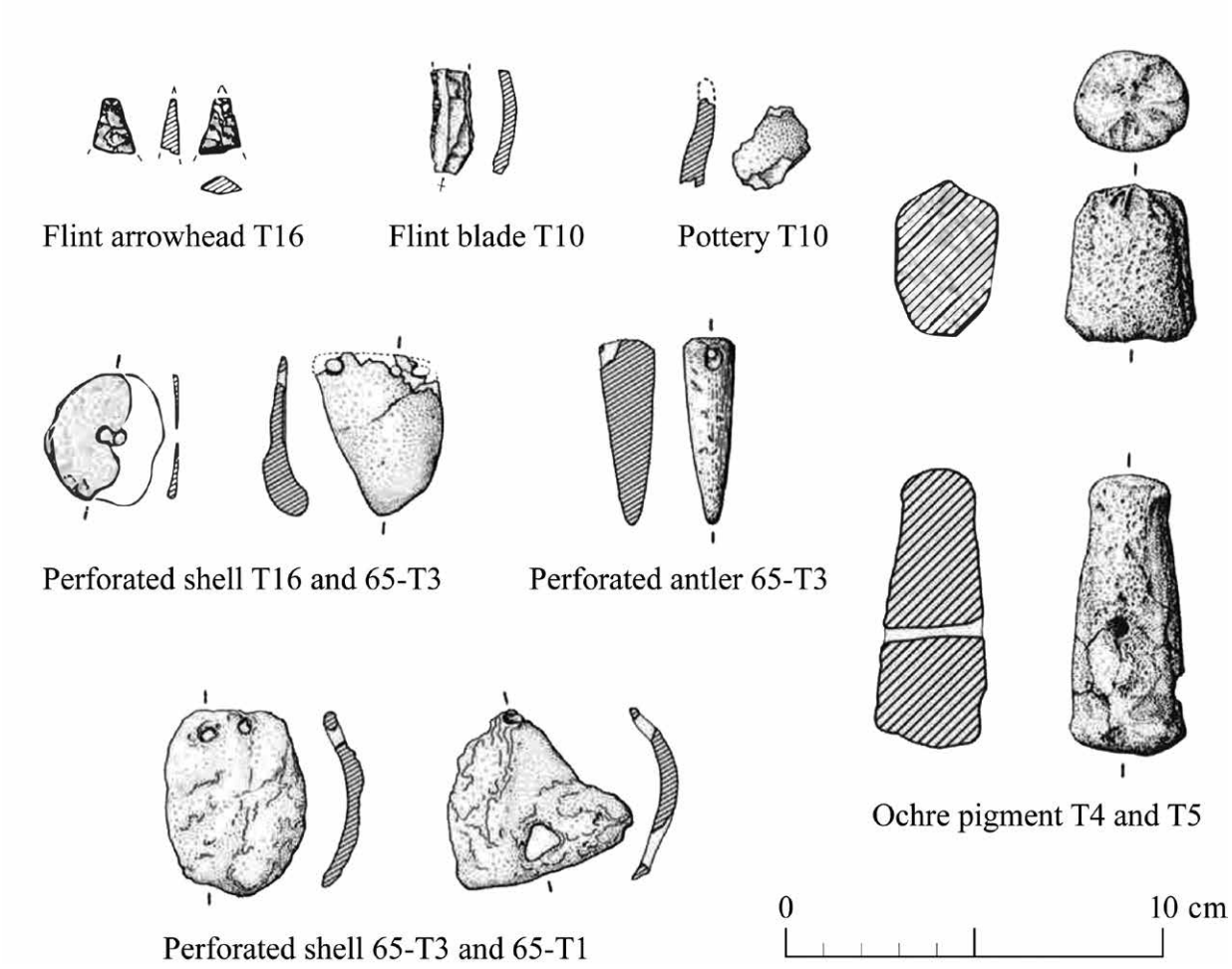


Figure 65: Corseaux-sur-Vevey, En Sayton. Different types of grave goods (source: Baudais and Kramar 1990).

fragments were found on the grave floor and the pelvic region of the adult female from T4 (Fig. 62.2). On the basis of comparative finds of pectorals, an arrangement into two rows with one above the other was assumed (Baudais and Kramar, 1990, 42–45) (Fig. 64). The tip of a deer antler was found within grave 65-T3 and assumed to be a pendant due to its V-shaped perforation on the rim (Baudais and Kramar, 1990, 41–42).

- Ornamental seashell objects were found within three graves: One in T16, one in 65-T1, and two in 65-T3. The originally disc-shaped fragment from T16 is from a Triton shell, while the three fragments from the 65-T1 and 65-T3 graves are from Charonia nodifera shell and probably also had two perforations originally (Baudais and Kramar, 1990, 41–42) (Fig. 65).
- Stone tools: Only three flint objects were found within stone cist graves, consisting of a fragmented blade from T10, a chip from T15, and an arrowhead fragment from T16 (Baudais and Kramar, 1990, 40–41) (Fig. 65).
- Pottery: Undecorated, small ceramic fragments were found within the three graves T1, 7, and 10 (Baudais and Kramar, 1990, 40).
- Colour pigments in the form of small ochre fragments were found within the five graves T3–5, 16, and 20 (Baudais and Kramar, 1990, 43).

4.5.2. Outlined sites

Pully, Chamblandes

Overview: The first graves of this eponymous site for Neolithic stone cists in the Western Alps were discovered in 1880 during construction work on the road "Chemin de Camblandes" in Pully (east of Lausanne). The necropolis is located on a natural terrace about 300 m north of the present shore of Lake Geneva, about 30 m above lake level, at an altitude of 405 m.

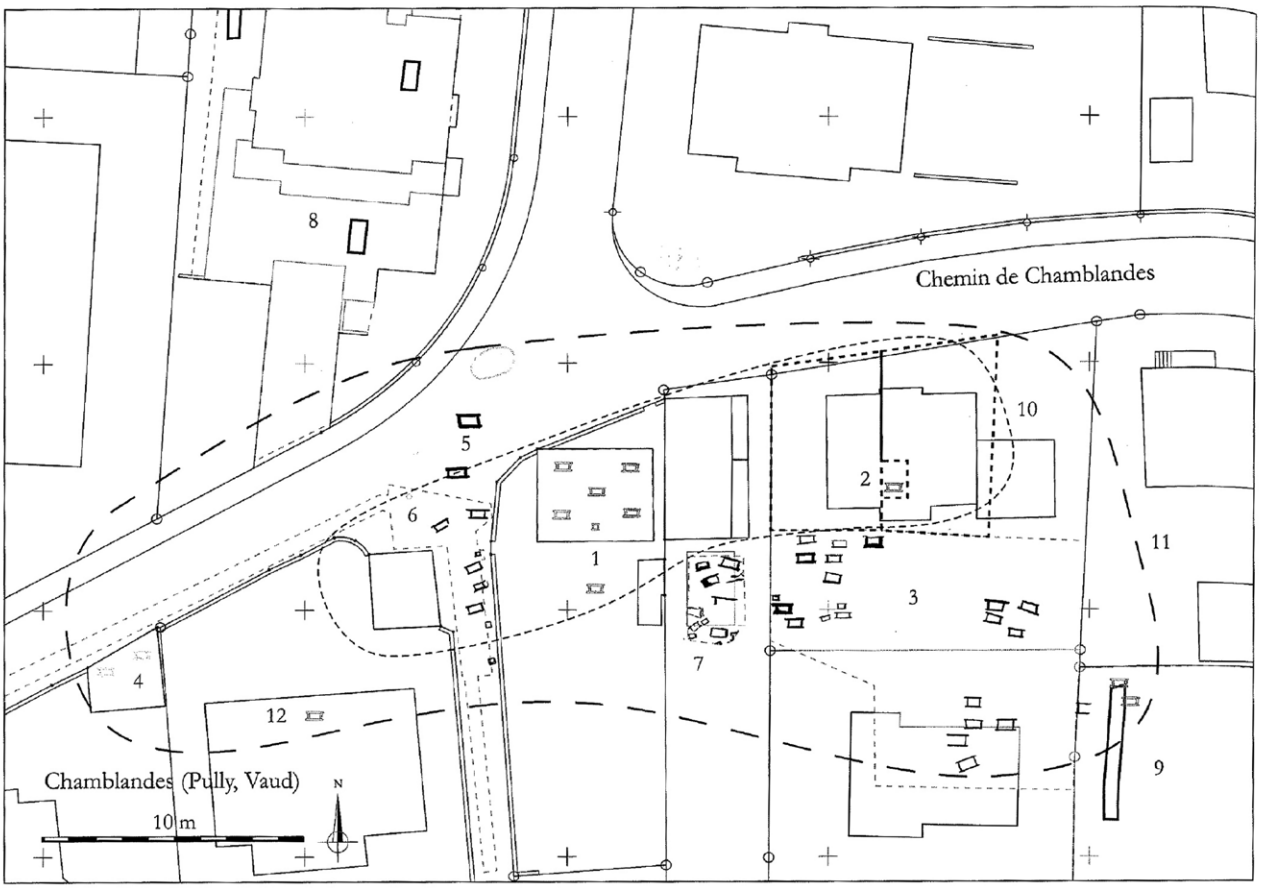


Figure 66: Pully, Chamblandes. Map of the site (source: Moinat 2007).

Over the last 100 years, numerous excavation campaigns have occurred; however, the information about the graves discovered before 1900 is very inaccurate. Thus, it is not possible to assign these human remains to specific graves or contexts. This site mainly gained notoriety through the excavation campaigns conducted between 1901 and 1910 under Albert Naef and Alexandre Schenk, during which around 23 stone cist graves were extensively documented through photographs, drawings and plans (e.g. Fig. 2). In general, the human remains excavated before 1940 are well preserved, but, according to Patrick Moinat, mixed or wrongly inscribed (Moinat, 2007, 202). Thus, these different excavation campaigns between 1880 and 1992 make a uniform analysis of this important necropolis difficult or even impossible in the scope of the current study. In addition, in summer 2021, some eight additional stone cist graves assumed to belong to this necropolis were discovered.

Concerning the extent of the site, Patrick Moinat assumes that it extended over 2400 m^2 (approx. 80 m east-west and 30 m north-south), with up to 300 graves (Fig. 66). In addition, the presumed southern and western edge of the necropolis was identified during the excavation campaign in 1984. At least 71 graves were excavated or located before destruction. These were exclusively stone cists, uniformly formed by four lateral stone slabs and a capstone (Moinat, 2007, 204).

The majority of the stones used were regional sandstone, with the nearest known quarry site approximately 1.5 km away. Concerning the placement of graves, a stone slab was discovered between graves T2 and T3 of the 1984 excavation and was addressed as a possible grave marker, similar to the one discovered at Corseaux, En-Seytion (Moinat and Simon, 1986, 43–44).

The MNI of 69 graves are available: 21 stone cists appeared empty of human remains, 17 contained the bones of one individual, and 13 were double burials. Of the graves, 26% (n = 18) contained the remains of between three and a maximum of seven individuals (Moinat, 2007, 199). The “empty” stone cists occasionally contained grave goods and were generally

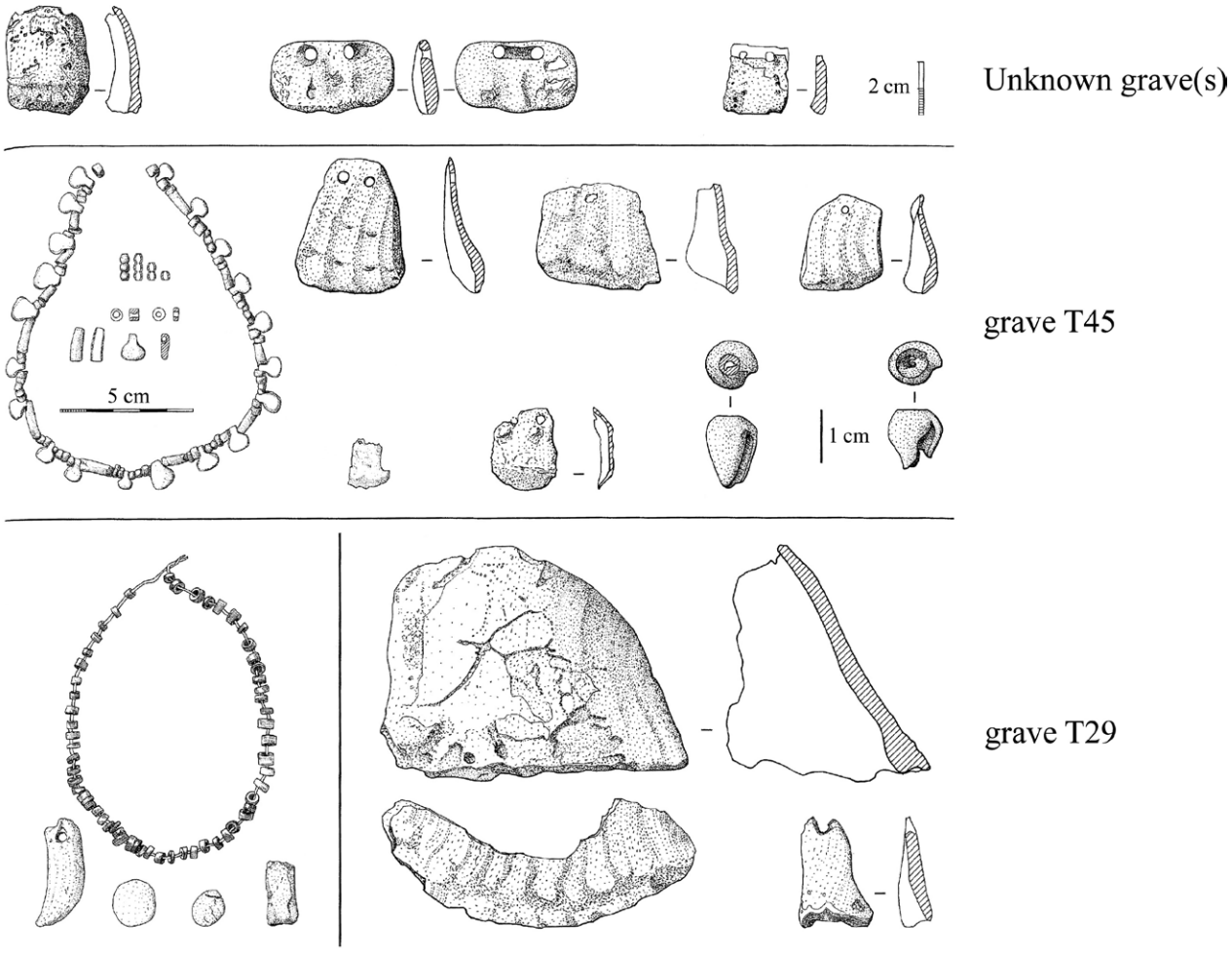


Figure 67: Pully, Chamblandes. Ornamental grave goods (source: Moinat 2007).

smaller in size. It was assumed that they served as graves for infants, with the fragile bones not preserved in the acidic soil. Concerning the collective graves with 3–7 burials, the presence of exclusively male and female individuals was noted (Moinat, 2007, 204).

The individuals were placed on their left side (on some occasions on the back), with the lower limbs flexed and uniformly oriented east (Moinat, 1994, 124). For the collective burials excavated in 1984, it was observed that the individuals must have been buried in relatively short time intervals, since the individuals at the bottom of the grave were not majorly disturbed or displaced by subsequent burials. Nevertheless, the graves were sometimes emptied or the bones pushed to the corners. For example, for a collective grave excavated in 1901, it was reported that the primary burials of two adults and one child were found placed in the centre of the cist, while an additional pit below the grave floor contained the long bones and skulls of two other individuals (Moinat and Simon, 1986, 45).

Regarding grave goods, at least six pectorals made of perforated boar tusks were mentioned (Moinat, 2003, 125–126). In addition, various perforated seashells, types of beads (made of jet, limestone, stone seed, etc.), ochre pigments, and one perforated stone axe “Lochaxt” were found (Moinat and Simon, 1986, 39) (Fig. 67).

Lausanne, Vidy

Overview: This vast necropolis is located on the Route de Chavannes in Vidy, a district of Lausanne. It is located on a natural terrace, around 300 m north of the present shore of Lake Geneva (about 10 m above the present lake level, at about 385 m in altitude). The necropolis was discovered in 1962 and, during a short excavation campaign, 27 stone cists

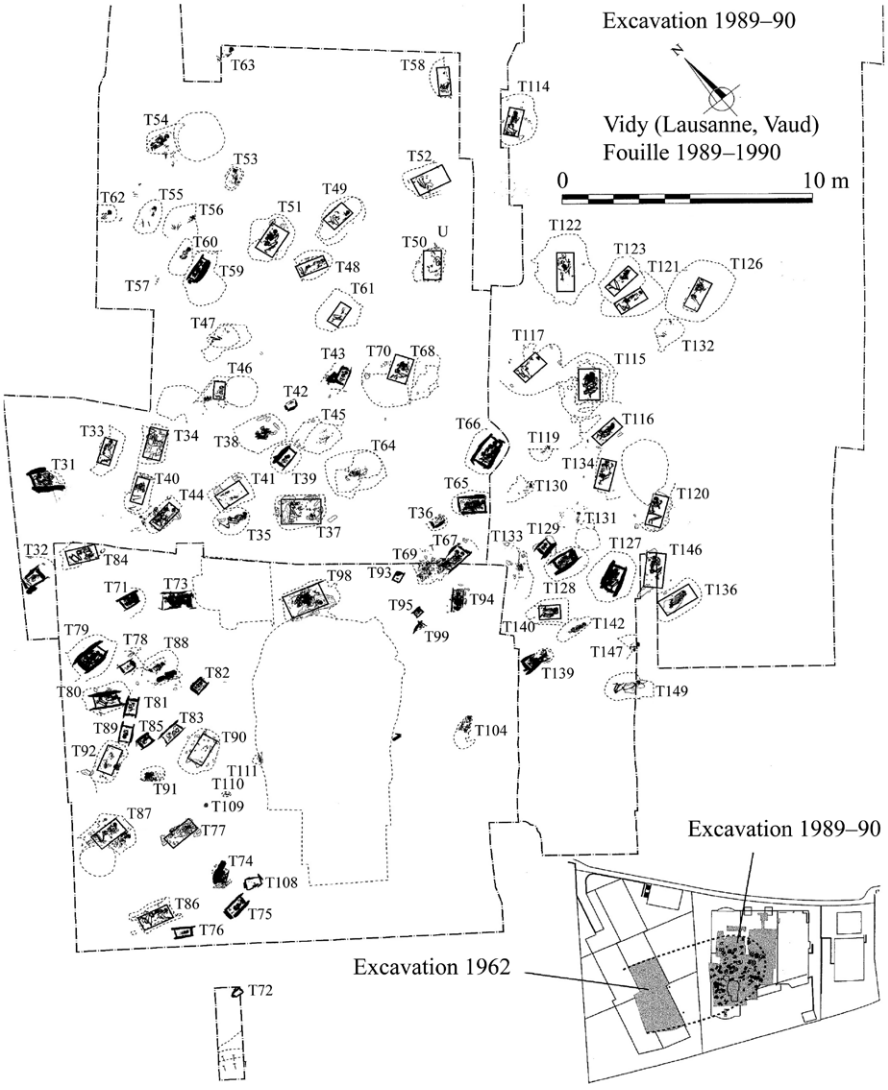


Figure 68: Lausanne, Vidy. Map of the site (source: Moinat 2007).

were located and documented. Between 1989 and 1990, the site was extensively excavated, and 99 graves were examined. The necropolis covers an area of approximately 870 m^2, and the original extent was estimated to have consisted of at least 100 additional graves, for a total of approximately 230 graves (Moinat, 2007, 197) (Fig. 68). An overall publication of this site is still pending, so only the available key data for the subsequent analysis are listed here.

The 126 known graves of this necropolis consist of 52 stone cists, 40 wooden cists, and 24 pit graves with no evidence of specific funerary architecture. The rectangular stone cists were formed of four to six lateral stone slabs with one or more capstones. Wooden cists were recognised based on soil discolouration, wedge stones, or wood traces. In addition, anthropological observations could occasionally show that the decomposition of the bodies must have taken place in hollow space. For some graves, these findings are missing, and burial in a simple pit was thus assumed (Moinat, 1997, 40). Exceptions are the larger graves T36 and T98, which were placed close to each other and were made of a mixed architecture of stone slabs and wooden planks. For example, T98 had an interior area of 180 by 103 cm and contained the remains of at least ten burials, six of which were in primary positions. In addition, two other graves from 1962 are significantly longer than the other stone cists, and the individuals were probably in stretched supine position (Moinat, 2007, 215–216).

On average, the top of the cists was just 15–35 cm below the Neolithic surface. Strikingly, single burials were generally placed deeper below the Neolithic surface than the

Figure 69: Lausanne, Vidy. Flint arrowheads from T87 (source: Moinat 2007).

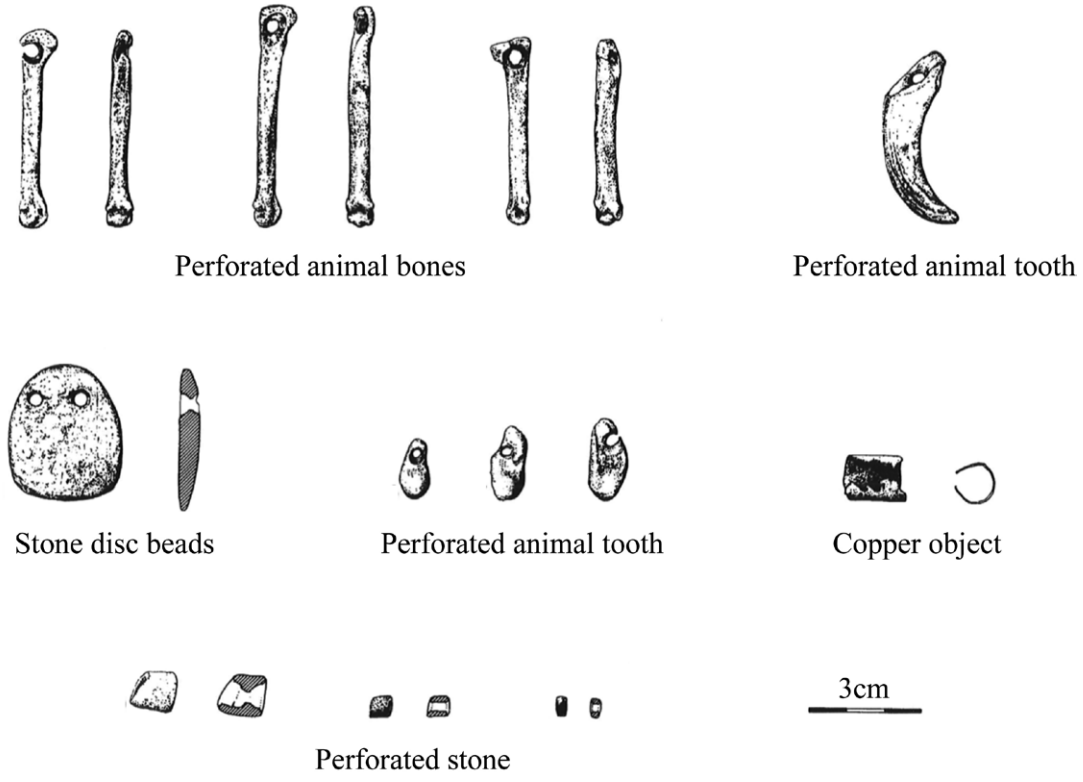


Figure 70: Lausanne, Vidy. Grave goods from T71 (source: Moinat 2007).

collective graves. This could mean that graves with multiple usage phases had to be better accessible than single-use graves. In some cases, the grave was probably marked with smaller standing stone slabs (T47 or T122) or accumulations of stones (T87 and T129; Moinat, 2007, 205–206).

The minimum number of individuals recorded in this necropolis is 245. Regarding specific burial practices, Patrick Moinat mentions 188 primary burials, 28 secondary burials, 23 "surplus bones" and six cremations, resulting in 56.4% single (n = 62) and double burials (n = 31). No human remains were found in five graves. The multiple burials consist of 11 graves with three individuals, seven graves with four individuals, six graves with five individuals, two graves with six individuals, and one grave each with the remains of at least eight and ten individuals (Moinat, 2007, 197–199).

The primary burials were generally placed on the left side of the body with the lower limbs contracted. Regarding the orientation of these individuals, a wider dispersion was noted between the northeast and southeast, and at least two burials (within T34 and T89) were oriented in the opposite direction towards the southwest. Regarding spatial organisation, smaller groups of five graves each with a similar orientation were suggested (Moinat, 2007, 204). Concerning secondary burial practices, next to the moving of bones

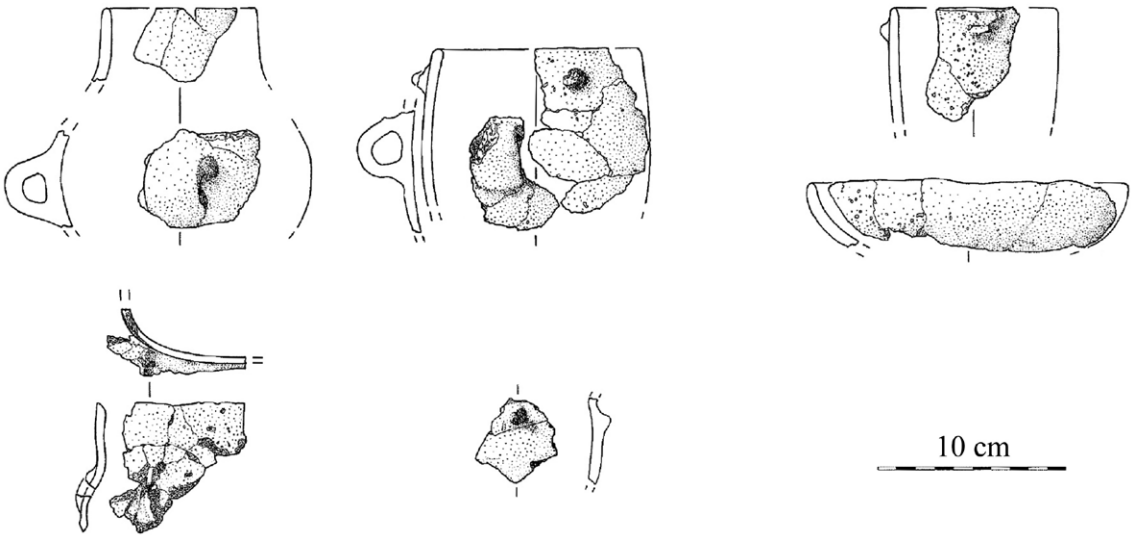


Figure 71: Lausanne, Vidy. Ceramic vessels from T87 (source: Moinat 2007).

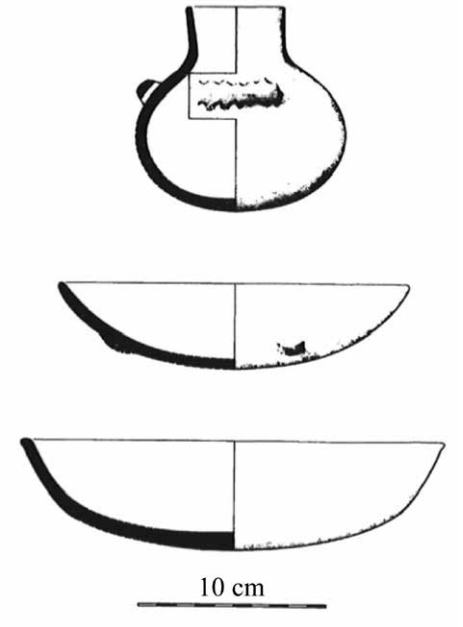


Figure 72: Lausanne, Vidy. Ceramic vessels from T44 (source: © Moinat 1997).

for new burials, the deposition of single human remains, "surplus bones" or the removal of skeletal elements ("réductions") were noted (Moinat, 1997, 42–43).

Regarding grave goods, at least one perforated stone axe "Lochaxt" and one flint axe of the Glis type were noted in adult single burials, along with some flint arrowheads (e.g. in T87, Fig. 69), or red ochre pigments (e.g. in T79). Ornamental elements found within the graves consist of seashells, disc beads, Glis buttons (e.g. in T87), or a single "Doppelknopf" bead from grave T7 (Moinat, 1997, 43–44) (Fig. 70). In contrast to most of the other covered Neolithic cist sites, some graves of Lausanne, Vidy, contained ceramic vessels (often associated with wooden cist graves). The pottery presented so far consists of bag-shaped pots with handles (in T87 and T122), spherical pots, or bottles with handles (in T44 and T87), bowls with knobs or lugs (in T44, T87, and T92) and at least one vessel with a square opening from grave T87 (Stöckli, 2016, 103–104) (Figs. 71 and 72). Variable bones from game animals were found within some graves and a symbolic meaning ("idéologie de la chasse") was assumed (Moinat, 2007, 217–218).

4.6. Swiss Plateau

The research focus in this zone was on the necropolis of Lenzburg, Goffersberg (Chapter 4.6.1), and the grave groups of Däniken, Studenweid (Chapter 4.6.2). The outlined sites consist of Wettingen, Schartenstrasse, and Erlanbach, Geren (Chapter 4.6.3) (for the location of sites, see Fig. 1).

4.6.1. Lenzburg, Goffersberg

I. Context

This site, consisting of 16 stone cists and a complex funerary monument, is located on the Schlossgasse road between the two molasse hills of the western Schossberg (508 m altitude) and the eastern Goffersberg (507 m altitude) east of the city of Lenzburg. It is situated around 3 km south of the Aare River on the Swiss Plateau (at an altitude of 460 m).

II. Background

The first stone cist (named SKG 1) was discovered in January 1959, during the construction of a wall around the Goffersberg water reservoir. The intact half of this grave was subsequently documented by the archaeological unit of the canton of Aargau (Kantonsarchäologie Aargau KAAG). In March 1959, further structures were discovered during excavation work for the construction of a parking lot south of SKG 1. Due to the recognised scientific potential and limited resources, the KAAG requested the Swiss National Museum to conduct an archaeological rescue excavation of this site. This investigation was carried out under the direction of René Wyss from March 3 to 11 and uncovered a zone of stacked stone slabs of the later recognised funerary monument and the remains of a further stone cist (SKG 3). In addition, traces of four additional stone cists (SKG 4–7) were recognised in the profile section of an excavated pipe trench (approximately 20 m south of SKG 1). Since an onsite evaluation was not possible due to time constraints, these graves were lifted as blocks and transported as a whole to the Swiss National Museum for further examination. In the course of these subsequent investigations, the scientific significance of these stone cists with collective burials was recognised. The discoveries of the rescue excavation of March 1959 indicated an extensive necropolis, and further construction work was planned for the completion of the parking lot. Thus, the cantonal government of Aargau permitted the systematic investigation of the site by the Swiss National Museum (Wyss and Scheffrahn, 1998, 12).

Excavation Campaign I, June–July 1959: The assumptions were quickly confirmed, and four well-preserved stone cist graves (SKG 8–11) were discovered, subsequently recovered as blocks in the zone between SKG 1 and the southern pipe trench. In the northeastern excavation area, a complex structure of stacked stone slabs was revealed. During the excavation of the uppermost stone debris, several small stone chambers arranged in rows were recognised. Some sections, especially the northeastern section, had largely been destroyed during previous construction work. The structure was given the designation “funerary monument” (with the sequential number 2) and was also recovered by cranes in late autumn.

Excavation Campaign II, May–June 1960: In order to clarify the extent of the necropolis, some exploratory trenches were investigated east and south of the known graves. In the process, six additional stone cists were discovered, and SKG 12–15 and 17 were recovered as blocks. Stone cist grave 16, on the southern slope of the Schlossberg, had already been heavily disturbed by agricultural activities and was subsequently uncovered onsite (Wyss and Scheffrahn, 1998, 12–18).

Grave structures as museum objects: Most grave structures from the necropolis of Lenzburg were not excavated on site, but lifted as blocks. In the field, a coat of plaster was applied to protect and stabilise the often weathered and brittle stone slabs. Afterwards,

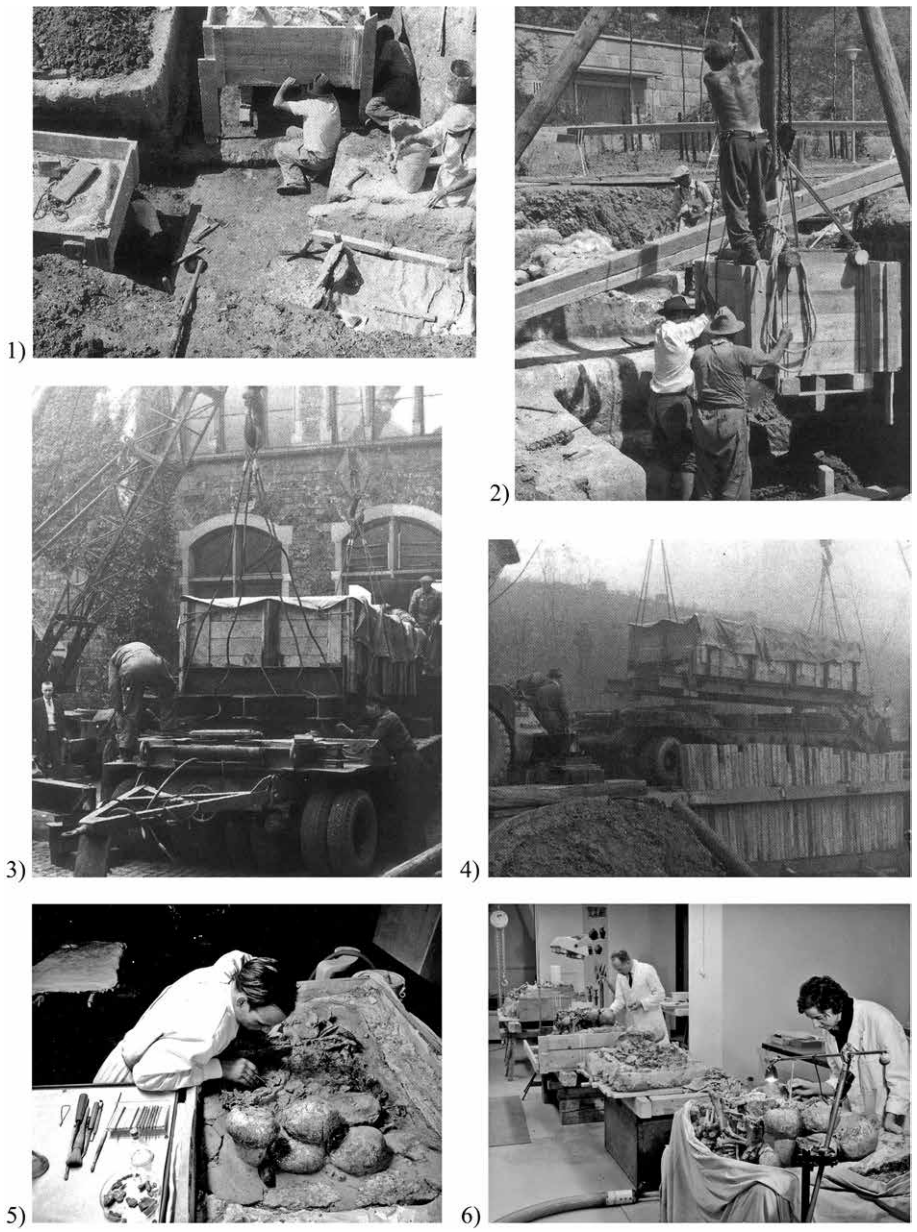


Figure 73: Lenzburg, Goffersberg. Selected pictures: 1–2) block lifting of the stone cists, 3–4) block lifting of the funerary monument, 5–6) dissection of the graves (source: Swiss National Museum).

wooden casings were built around each grave to be able to lift the whole block by crane. The complex block lifting of the large funerary monument, weighing about 30 tonnes, required more than three weeks of preparation and two crane trucks (Wyss and Scheffrahn, 1998, 18–28) (Fig. 73.1–4).

These recovered grave structures were transported and subsequently dissected and documented layer by layer in the laboratory of the Swiss National Museum in Zurich. Stone cists with well-preserved human remains with skeletal elements still in anatomical connection (SKG 4, 8, 9 and 12) were to be left mostly in the condition they were found in for exhibition purposes. Therefore, these skeletal remains were cleaned of superficial soil material and, together with the underlying sediment, hardened with binding agents (Wyss and Scheffrahn, 1998, 23) (Fig. 73.5–6).

From the very beginning, the aim was to make the museum presentation as clear as possible and thus make the complex findings comprehensible to the broad public. Subsequently, these grave structures were exhibited in the Swiss National Museum, and

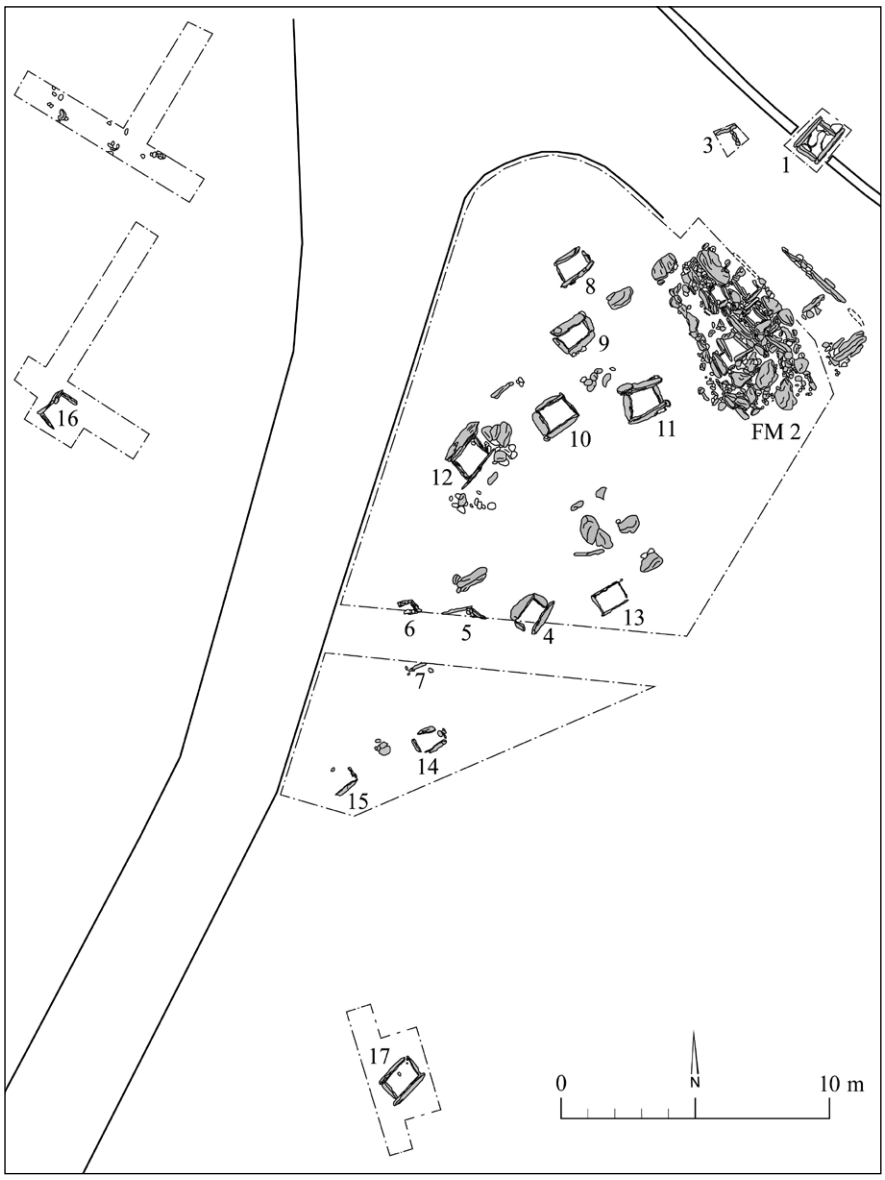


Figure 74: Lenzburg, Goffersberg. Map of the site (source: N. Steuri after Wyss 1998).

between 1985 and 2009, gradually transferred to the depot of the archaeological unit of the canton of Aargau and the Museum Burghalde in Lenzburg, where the funerary monument and two cist graves can now be viewed in its permanent exhibition.

Location of the human remains: In July 2020, an inventory of the human remains from the necropolis of Lenzburg was conducted in the context of this research. In the archive of the KAAG in Brugg (Aargau, Switzerland), boxes with the bones from graves SKG 5, 10, and 13 were located. Whether these ensembles were complete could not be assessed at that time. This made it evident that, with the exception of the bones from the stone cist graves prepared as museum objects (SKG 4, 8, 9 and 12), the location of the human remains from more than half of the graves was unclear. Nevertheless, between 2010 and 2012, Marco Milella recorded numerous temporal bones from the collection of the Anthropological Collection of the University of Zurich and, apparently, this research project included bones from the Lenzburg necropolis. After a comparison between the documented inventory numbers, it became clear that they correspond to the recorded individuals by Wyss. After an inquiry, Marcia Ponce de León, curator of the anthropological collection of the University of Zurich, confirmed that the missing bones from the stone cist graves from Lenzburg were indeed in

their collection. The ownership of these "lost" human remains was then clarified and the bones were transferred to the archive of the archaeological unit of the canton of Aargau in 2021.

III. Spatial organisation of the necropolis

According to Wyss, the necropolis probably had an oval form and extended to around 40 by 30 m with a total of approximately 60 graves, since the stone cists appear to have been arranged at distances of 1–2 m (Wyss and Scheffrahn, 1998, 28) (Fig. 74). Additionally, it was reported that "mass graves" were destroyed during the past construction of the Schlossgasse road (Wyss and Scheffrahn, 1998, 11). The total extent of the necropolis remains unclear, and a geophysical investigation of the site could be promising, as the area to the south and east seems especially untouched by modern construction work. To the west, the necropolis was probably delimited by the relatively steep southeastern slope of the Schlossberg.

Based on comparative sites, it can be assumed that the stone cists from Lenzburg, Goffersberg, were at least partially constructed below the Neolithic surface level. Probable burial pits could only be stratigraphically identified at SKG 4 and 13. They indicate that the (no longer present) capstones were at the level of the prehistoric surface and therefore visible and accessible. No grave markings were noted by the excavators, but in this context, smaller (upright) stone slabs found between the cist graves are noteworthy.

The construction of the stone cists probably followed the same pattern as observed in other sites: an oval pit was dug and four lateral slabs were placed in it and wedged in place by smaller stone fragments. The area between the pit wall and the outside of the lateral slabs was backfilled afterwards with sediment material. In some cases, the grave floor was additionally paved by some small, irregular stone slabs.

The remains of capstones were only found on graves SKG 1 and 9. They can be assumed for the other stone cists but were probably removed in recent times (for example, in the context of agricultural activities). The used stone slabs weigh up to 200 kg and are made of shell limestone. A quarry for this rock can be found at the Goffersberg, a few hundred metres away from the site, and was used up until modern times (Wyss and Scheffrahn, 1998, 28–30).

IV. Individual grave description

The following is a detailed description of every stone cist grave and the funerary monument. This appears necessary, since a consistent account had been missing until now. In addition, Wyss assigned most of the recovered grave goods to specific individuals. This was mainly decided based on the spatial position of these objects, mostly disregarding taphonomic processes, which should be considered more strongly, especially considering multiphase collective burials in small stone cists. In addition, these assignments were based on other unverifiable assumptions; for example, arrowheads exclusively to male individuals. Therefore, these specific assignments were deliberately omitted here and only the quantifiable indication of the specific grave goods per stone cist was listed. All presented data are based on the publication by Wyss (1998). The MNI figures, as well as age and sex determination, were based on the skulls.

Grave SKG 1

- Grave architecture: Rectangular stone cist formed by four lateral stone slabs. Only a fragment of a presumed capstone was found. The grave floor was irregularly paved with larger limestone slabs. The cist was about 122 cm long and 82 cm wide and oriented northeast-southwest (Fig. 75.1–3).
- Human remains: At the time of the excavation, the stone cist had already been largely cleared. Only in the lower layer of the northeastern half of the chamber could some human remains still be examined. These fragmented long bones, ribs, jaws, and vertebrae were commingled and corresponded to at least five individuals. Age

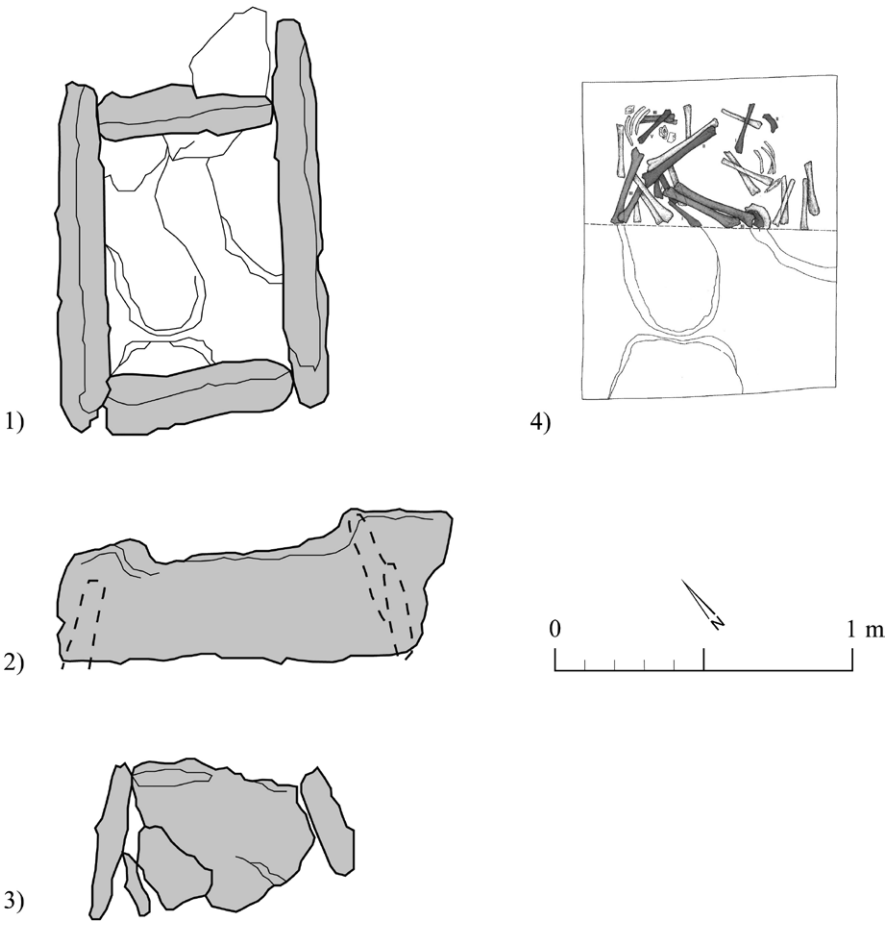


Figure 75: Lenzburg, Goffersberg. Drawings of SKG 1: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

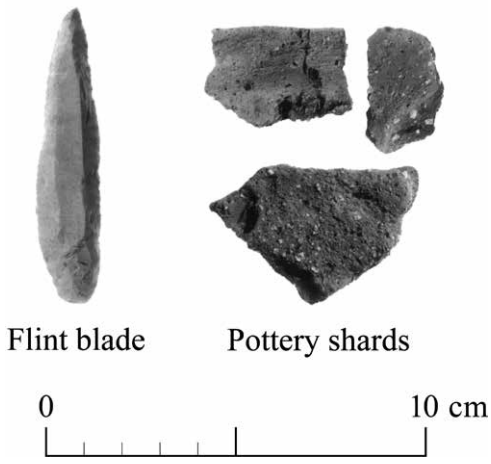


Figure 76: Lenzburg, Goffersberg. Pictures of the grave goods from SKG 1 (source: Wyss 1998).

and sex determination resulted in four adult individuals (one clearly male and one female) and one child (infant or juvenile). Due to the state of preservation and circumstances of discovery, it is not possible to assess whether this collective burial consists of primary or secondary burials (Fig. 75.4).

- Grave goods: One flint blade, two flint chips, and three pottery fragments (of which one was a rim sherd) could be recovered (Fig. 76).

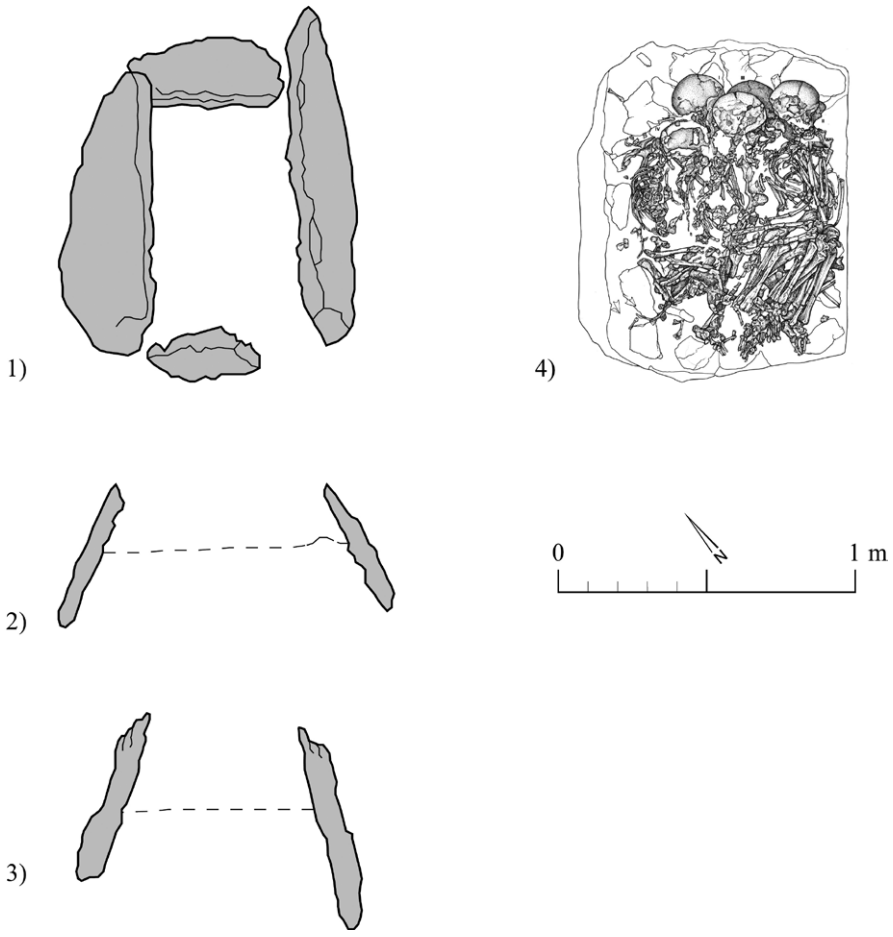


Figure 77: Lenzburg, Goffersberg. Drawings of SKG 4: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

Grave SKG 3

- Grave architecture: The structure has been heavily disturbed. Only fragmented pieces of two lateral slabs, which formed the northeastern corner of the cist, were preserved.
- Human remains: Only skull and jaw fragments from two adult individuals, probably female, were collected.
- Grave goods: No finds were recorded.

Grave SKG 4

- Grave architecture: A rectangular stone cist formed by four lateral stone slabs. The grave floor was partially paved with a smaller stone slab. The cist was about 110 cm long and 82 cm wide and oriented in a northeast-southwest direction. This grave was prepared for museum exhibition and therefore not completely excavated (Fig. 77.1–3).
- Human remains: The grave content was largely undisturbed and consisted of the human remains of six individuals. They were placed in two superimposed layers of three burials each (Fig. 79). Ind. 1 (adult, male), Ind. 2 (11- to 13-year-old), and Ind. 3 (adult, female) were placed next to each other on the grave floor on the left side of their bodies with the lower limbs flexed (knees above pelvic level), facing southeast. Ind. 4 (about 5 years old) was placed directly on top of Ind. 1 in the eastern section of the stone cist. Afterwards, the bodies of Ind. 1 to 4 (with the

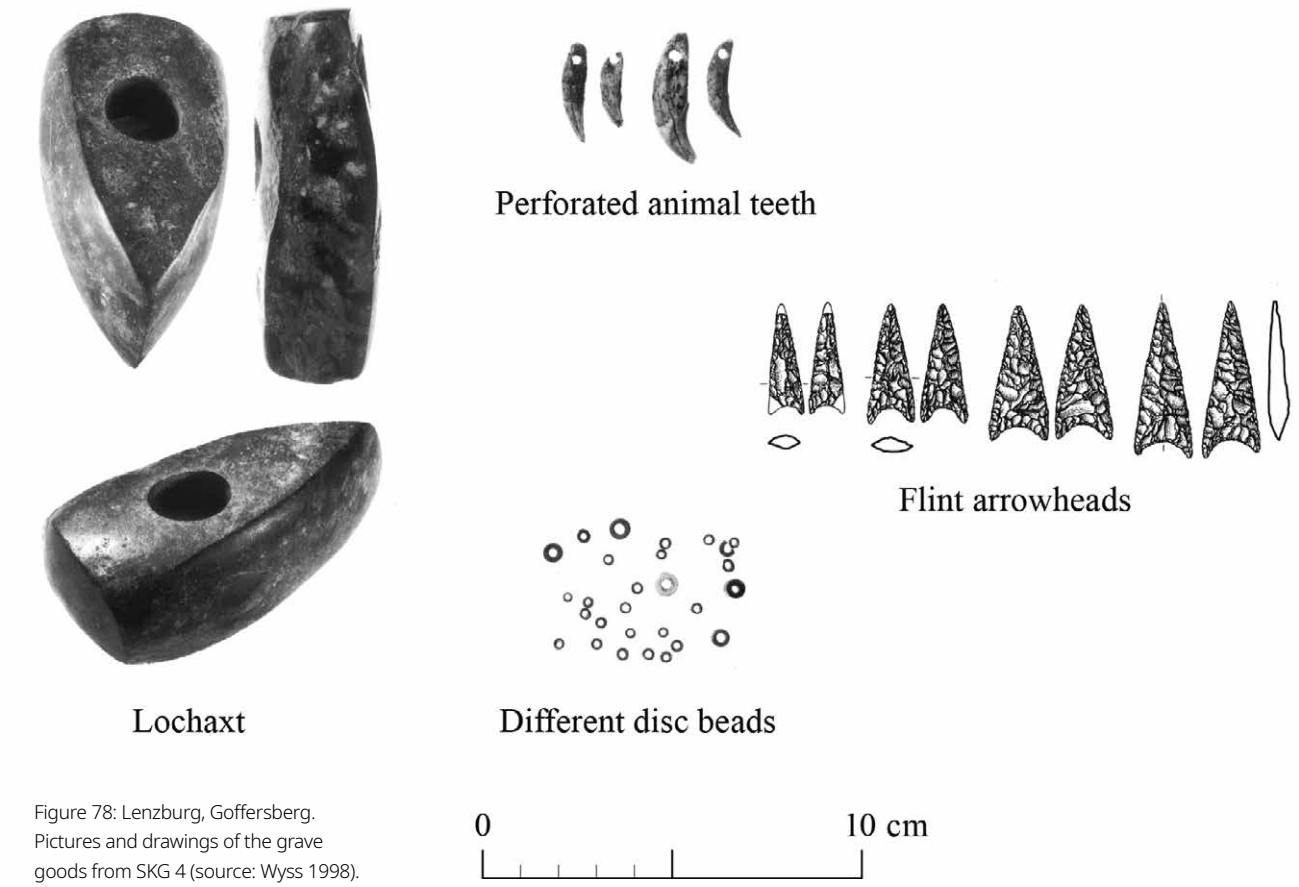


Figure 78: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 4 (source: Wyss 1998).

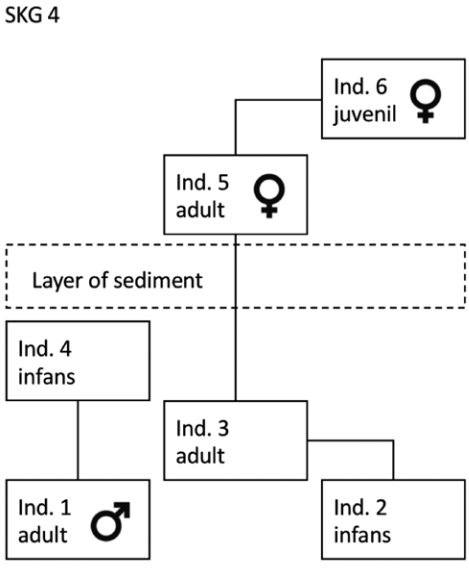
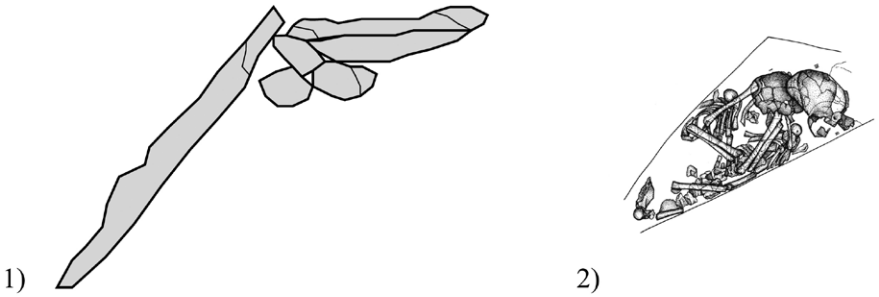


Figure 79: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 4.



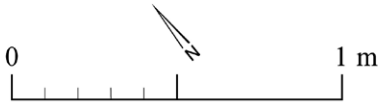


Figure 80: Lenzburg, Goffersberg. Drawings of SKG 5: 1) top view of the grave structure, 2) human remains within the grave (source: N. Steuri after Wyss 1998).

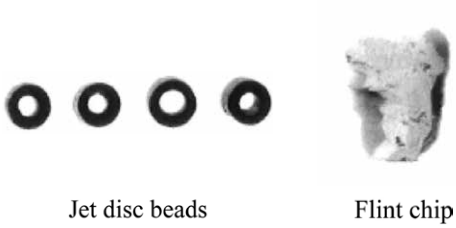


Figure 81: Lenzburg, Goffersberg. Pictures of the grave goods from SKG 5 (source: Wyss 1998).

exception of the skulls) were covered with sediment. This was addressed as a levelling layer and reached a thickness of up to 10 cm. Subsequently, the burial of Ind. 5 (adult, female) followed in the centre of the grave on this layer of soil and Ind. 6 (juvenile, female) along the eastern lateral slab, both on the left side of the body with flexed lower limbs (Fig. 77.4).

- Grave goods: One perforated stone axe ("Lochaxt") and four flint arrowheads with an elongated tip and concave base were found. In addition, four perforated canine teeth, 27 jet disc beads of different sizes, one tube-shaped bead made of limestone, and one serpula bead (fish vertebra) were interpreted to have been part of a necklace (Fig. 78).

Grave SKG 5

- Grave architecture: The stone cist was heavily disturbed by construction work, and only fragments of two lateral slabs were still present (Fig. 80.1).
- Human remains: The bones from at least three individuals were recovered and, similar to SKG 4, the individuals appear to have been placed in two layers on top of each other. Ind. 1 (adult, male) was placed on the left half of the body with the back along the fragmented lateral slab. Skull fragments of Ind. 2 (juvenile) were found next to it. The remains of a third individual, Ind. 3 (adult, male), were placed directly on top of Ind. 1 (Fig. 80.2).
- Grave goods: Four jet disc beads and one flint blade or chip were recovered (Fig. 81).

Grave SKG 6

- Grave architecture: This grave was also heavily disturbed by the mechanical excavator, and only fragments of the northwestern lateral slab could be documented (Fig. 82.1).
- Human remains: The few recorded bones were heavily fragmented and consisted of skull fragments of an adult male (Ind. 1) and of a child (Ind. 2) (Fig. 82.2).
- Grave goods: No finds were recorded.

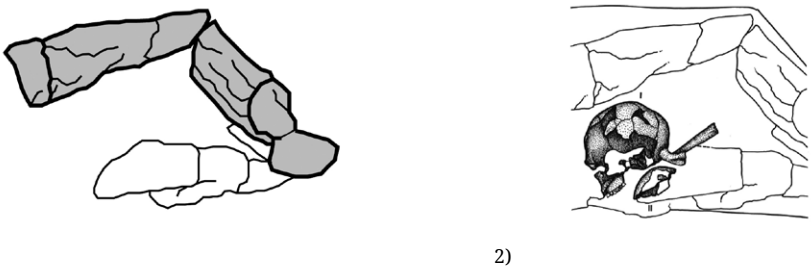


Figure 82: Lenzburg, Goffersberg. Drawings of SKG 6: 1) top view of the grave structure, 2) human remains within the grave (source: N. Steuri after Wyss 1998).

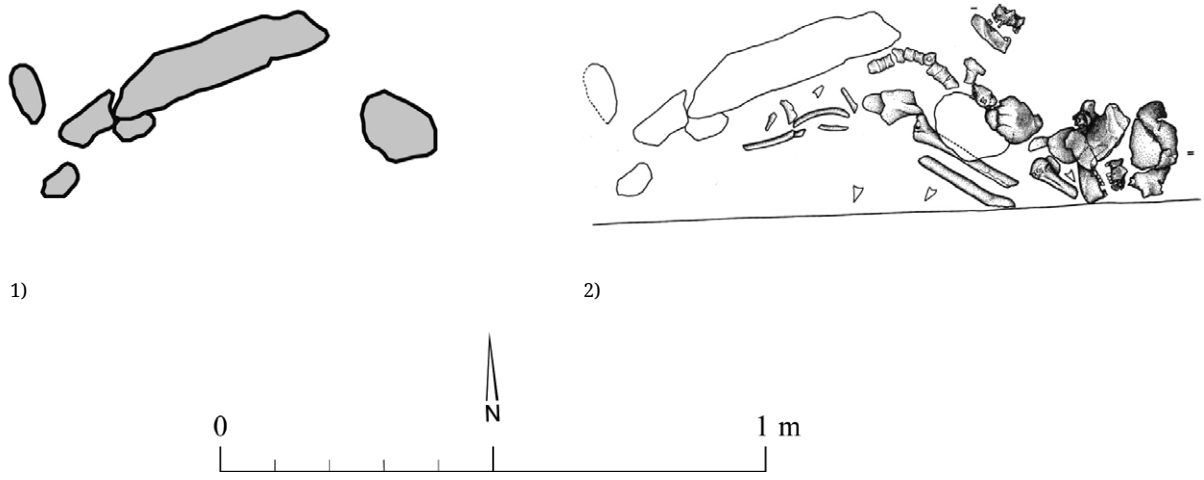


Figure 83: Lenzburg, Goffersberg. Drawings of SKG 7: 1) top view of the grave structure, 2) human remains within the grave (source: N. Steuri after Wyss 1998).

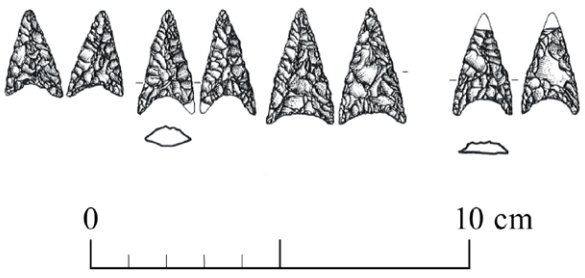


Figure 84: Lenzburg, Goffersberg. Drawings of the flint arrowheads from SKG 7 (source: Wyss 1998).

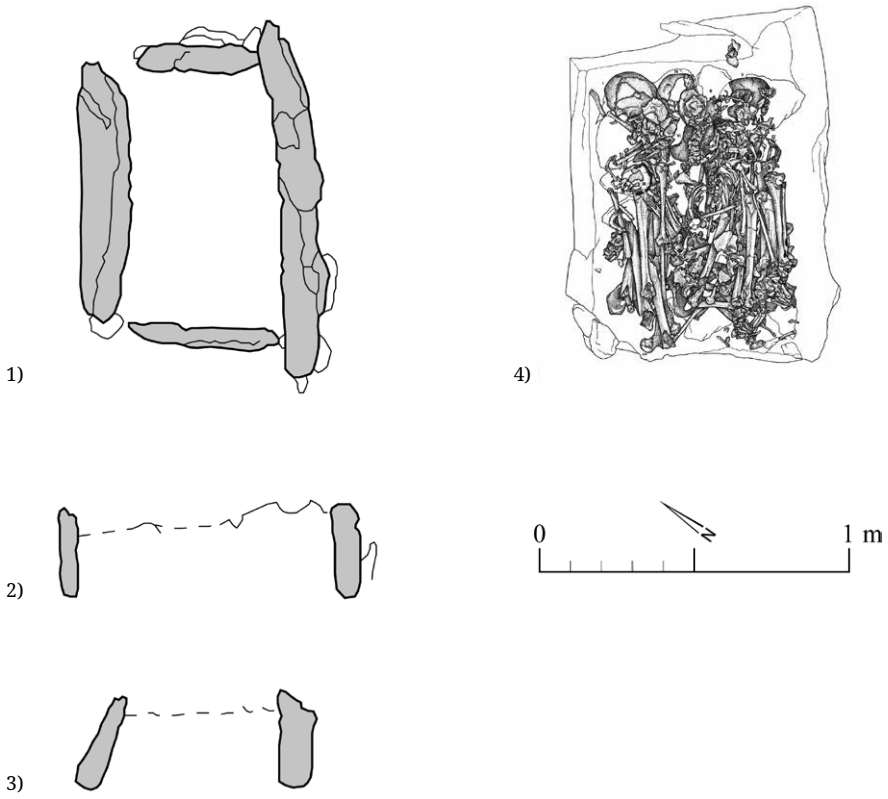


Figure 85: Lenzburg, Goffersberg. Drawings of SKG 8: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

Grave SKG 7

- Grave architecture: This grave was also heavily disturbed by the excavator, and only fragments of the northwestern lateral slab could be documented (Fig. 83.1).
- Human remains: Only some skull fragments of an adult male (Ind. 1) and bones of a child (Ind. 2) were recorded (Fig. 83.2).
- Grave goods: Four flint arrowheads were recorded (Fig. 84).

Grave SKG 8

- Grave architecture: Rectangular stone cist formed by four lateral stone slabs. There were large gaps between the corners, which allowed sediment to enter and fill the cist. The grave floor was (at least partially) paved with smaller stone slabs. The cist was about 103 cm long and 80 cm wide and oriented northeast-southwest. This grave was prepared for the museum exhibition and therefore not completely excavated (Fig. 85.1–3).
- Human remains: Based on the number of skulls, the remains of at least nine individuals are present in this grave. Wyss divided the burials into four levels, based on the relative stratigraphic position of the bones (Fig. 87): Level 1 consists of the human remains of Ind. 1 (adult, male) and Ind. 2 (adult, female) with the remains of an approx. four-year-old (Ind. 3) closely adjacent. These bones were all displaced by subsequent burials. Level 2 consists of Ind. 4 (adult, male) placed between Ind. 1 and 2 (displacing their remains) in a hyperflexed position (i.e. with the knees folded to the chest). An approx. 7-year-old child (Ind. 5) lay along the southern lateral slab (above Ind. 2). Ind. 6 (adult, male) was placed in the centre of the cist above Ind. 4 and formed Level 3. The uppermost level, Level 4, consists of Ind. 7 (juvenile), Ind. 8 (adult, male), and Ind. 9 (juvenile, male?). They were partially disturbed and placed close to each other (directly above the underlying human remains) (Fig. 85.4).

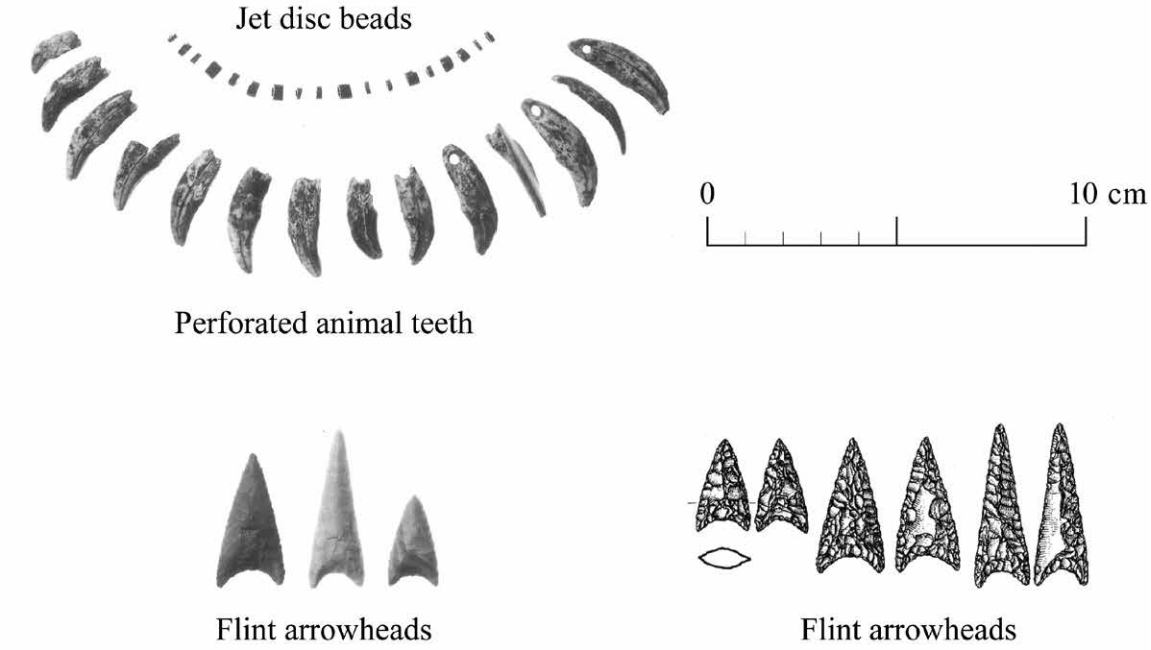


Figure 86: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 8 (source: Wyss 1998).

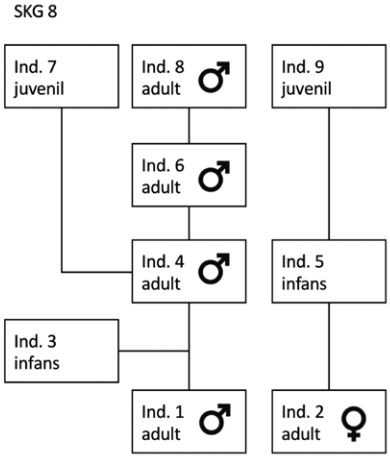


Figure 87: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 8.

- Grave goods: At least 31 perforated canine teeth (24 were found together and were probably part of a necklace) and 14 partially fragmented jet disc beads of various sizes were found. In addition, three flint arrowheads, a flint chip, a large boar-tusk fragment, and a pig canine, as well as two pottery sherds, were recorded (Fig. 86).

Grave SKG 9

- Grave architecture: A rectangular stone cist, formed by four lateral stone slabs. Irregular stone fragments found within the grave were assumed to be the remains of a missing capstone. The cist was about 113 cm long and 96 cm wide and oriented northeast-southwest. This grave was prepared for the museum exhibition and therefore not completely excavated (Fig. 88.1–3).
- Human remains: The bones showed a relatively good state of preservation and originate from at least 11 individuals. Wyss distinguished two "clearance levels" of displaced bones

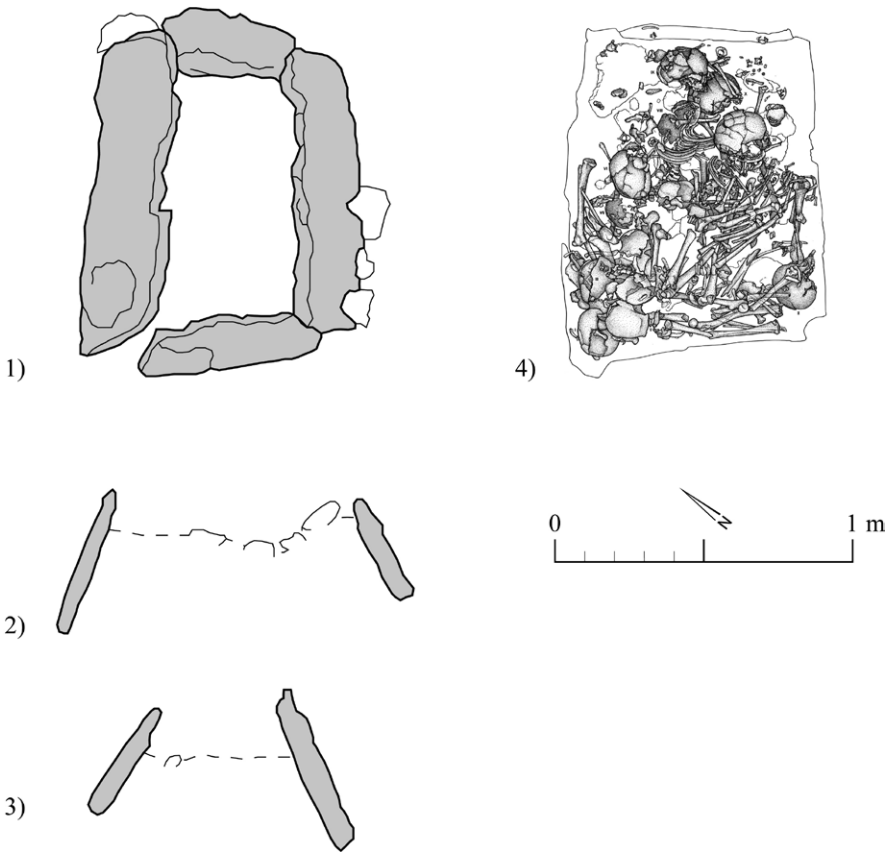


Figure 88: Lenzburg, Goffersberg. Drawings of SKG 8: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

and a primary burial phase with less disturbed human remains (Fig. 90). Clearance level 1 consists of the skulls and long bones of two adult males (Ind. 1 and 2) and a third adult individual (Ind. 3). These bones were pushed to the southwestern lateral slab of the stone cist. Above the skulls of the first clearance level, the commingled remains of four additional individuals in the southeast corner of the stone cist followed. This second clearance level consists of Ind. 4 (adult, male), Ind. 5 (mature, male), Ind. 6 (adult, female), and Ind. 7 (infant). It is difficult to assess whether these remains actually represent two clearing events. In addition, the proportion of smaller skeletal elements was relatively low within these commingled bones; therefore, they might represent the secondary deposition of certain human remains. There followed the primary burials of three subadult individuals (Ind. 8 to 10). These were placed on top of each other, generally on their left side with the lower limbs tucked (with the knees at about the level of the pelvis). From the stratigraphically last burial, 11- to 13-year-old Ind. 11, only the skull and jaw was found. Therefore, it was assumed to have represented a secondary skull deposition (Fig. 88.4).

- Grave goods: One flint blade was noted (Fig. 89).

Figure 89: Lenzburg, Goffersberg. Picture of a flint blade from SKG 9 (source: Wyss 1998).

Grave SKG 10

- Grave architecture: An almost-square stone cist made of four lateral stone slabs. The cist was about 115 cm long and 105 cm wide and oriented in a northeast-southwest direction (Fig. 91.1–3).
- Human remains: Already during the excavation, the different states of preservation of the bones and the partial absence of skeletal elements were noted. On the grave floor, the sparse remains of two subadult individuals (Ind. 1 and 2), assumed to represent the secondary deposition of bones, were documented. In between, the nearly complete skeleton of a ca. 15-year-old male (Ind. 3) was placed on the left side of the grave. These human remains were disturbed and pushed to the side by the burial of Ind. 4 (adult, male), lying on the left side of the body in a hyper-

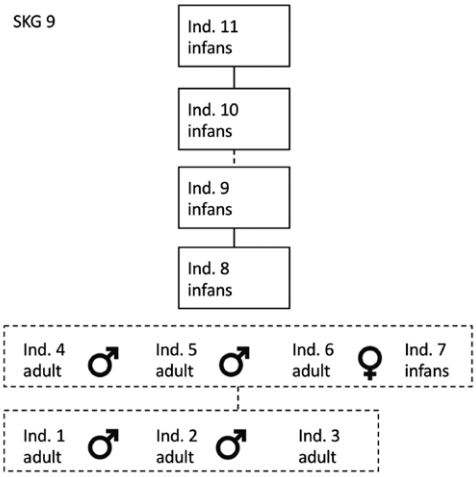


Figure 90: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 9.

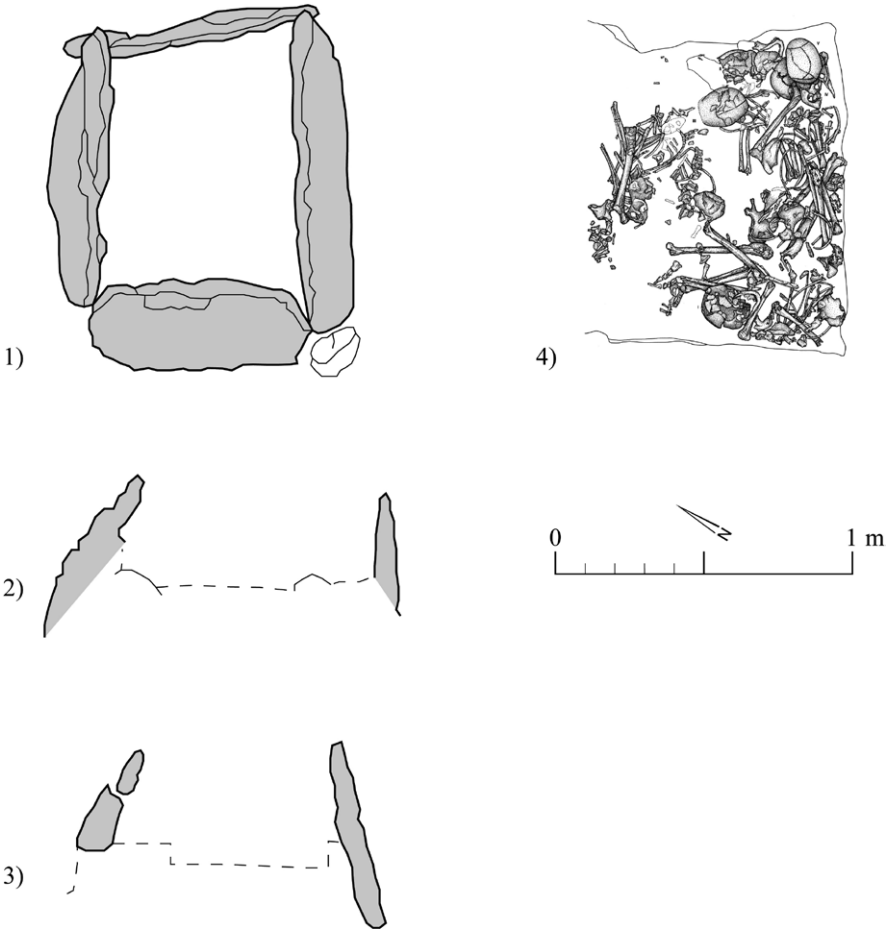


Figure 91: Lenzburg, Goffersberg. Drawings of SKG 10: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

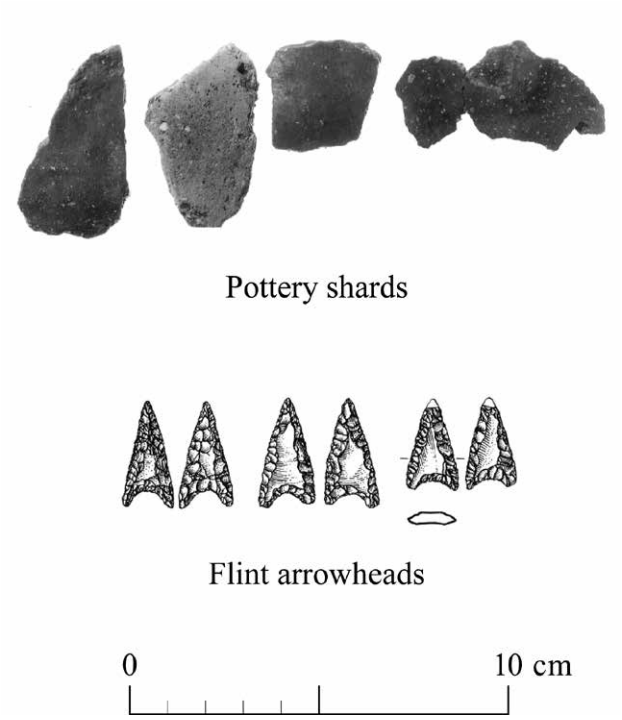


Figure 92: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 10 (source: Wyss 1998).

flexed position (knees almost to the chest). In the middle of the grave, between Ind. 3 and 4, followed the primary burial of another adult male (Ind. 5) with a similar placement (Fig. 91.4).

- Grave goods: Three triangular flint arrowheads and some 20 undecorated pottery fragments of different vessels (of unknown shapes) were noted (Fig. 92).

Grave SKG 11

- Grave architecture: A rectangular stone cist formed by four thick, lateral stone slabs (partially placed on wedge stones). An additional stone fragment was placed against the eastern lateral slab. The grave floor was paved with irregular stone fragments. The cist was about 115 cm long and 96 cm wide and oriented in a northeast-southwest direction (Fig. 93.1–3).
- Human remains: The different states of preservation of these bones were noted, and Wyss divided the grave content of at least seven individuals into three usage phases (Fig. 95). The first phase is represented by the human remains of three primary burials: Ind. 1 (mature, male), Ind. 2 (2-year-old), and Ind. 3 (adult, male), originally placed next to each other on the grave floor. In the second phase, calcined bones and charcoal fragments were placed in the centre of the stone cist (above the remains of Ind. 1 and 3). The cremated remains originate from at least two individuals (Ind. 4 and 5). At some point, these human remains were pushed to the eastern side of the cist and probably partially cleared from the grave. Afterwards, in phase 3, the primary burial, Ind. 6 (adult, female), was placed directly on the grave floor. The remains of a newborn (Ind. 7) were found in the abdominal area of this adult female (Ind. 6) (Fig. 93.4).
- Grave goods: A small stone axe blade, a flint arrowhead, a flint scraper, two bone/antler tools, a larger birch tar lump, and a fragmented pig tooth with signs of a perforation were documented. In the upper levels of the grave, five pottery fragments from at least two vessels, two flint blades, and a bird's beak were found (Fig. 94).

Grave SKG 12

- Grave architecture: A rectangular stone cist formed by four large lateral stone slabs (up to 230 cm long and 100 cm wide). The grave floor was paved almost entirely with smaller

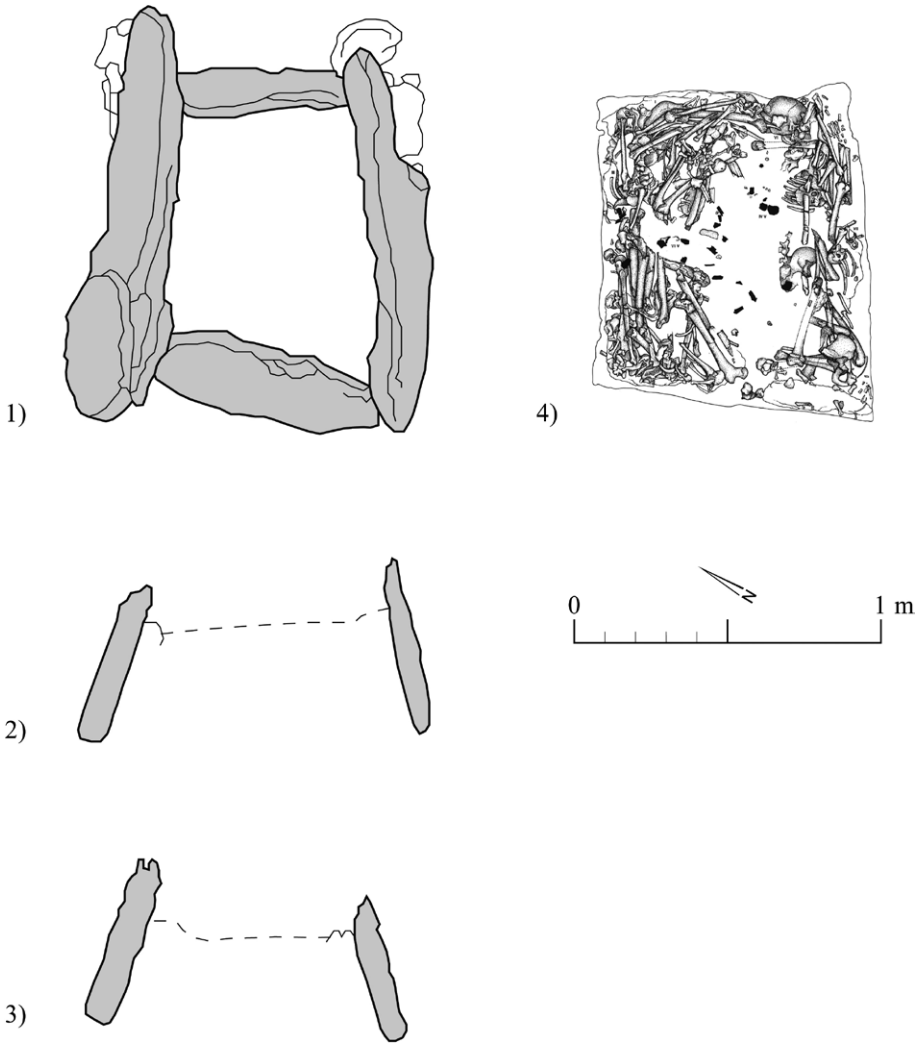
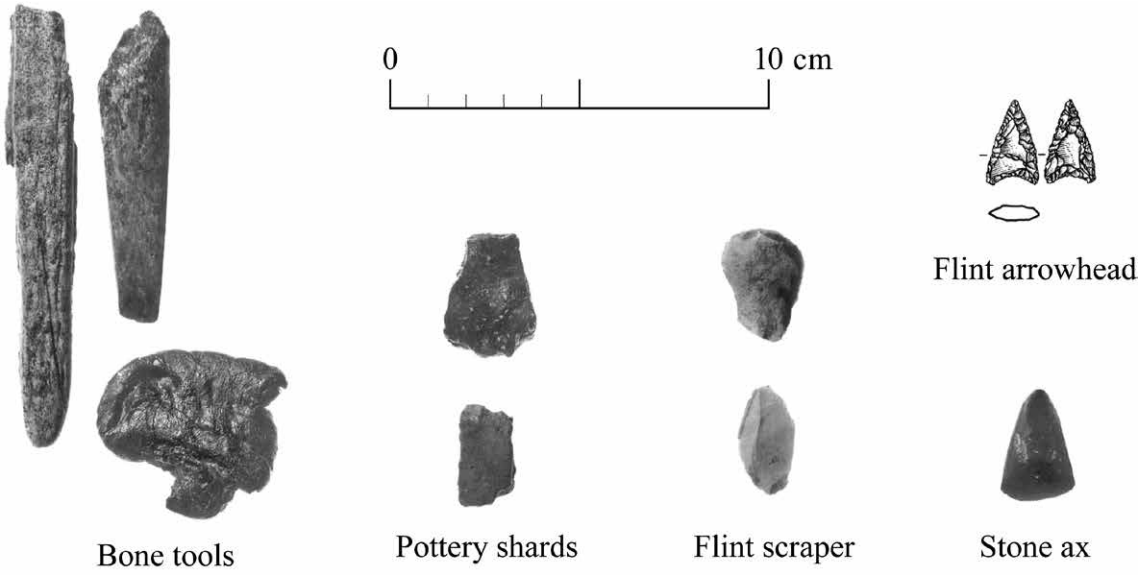


Figure 93: Lenzburg, Goffersberg. Drawings of SKG 11: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

Figure 94: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 11 (source: Wyss 1998).



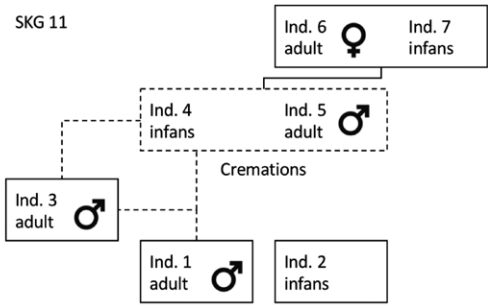


Figure 95: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 11.

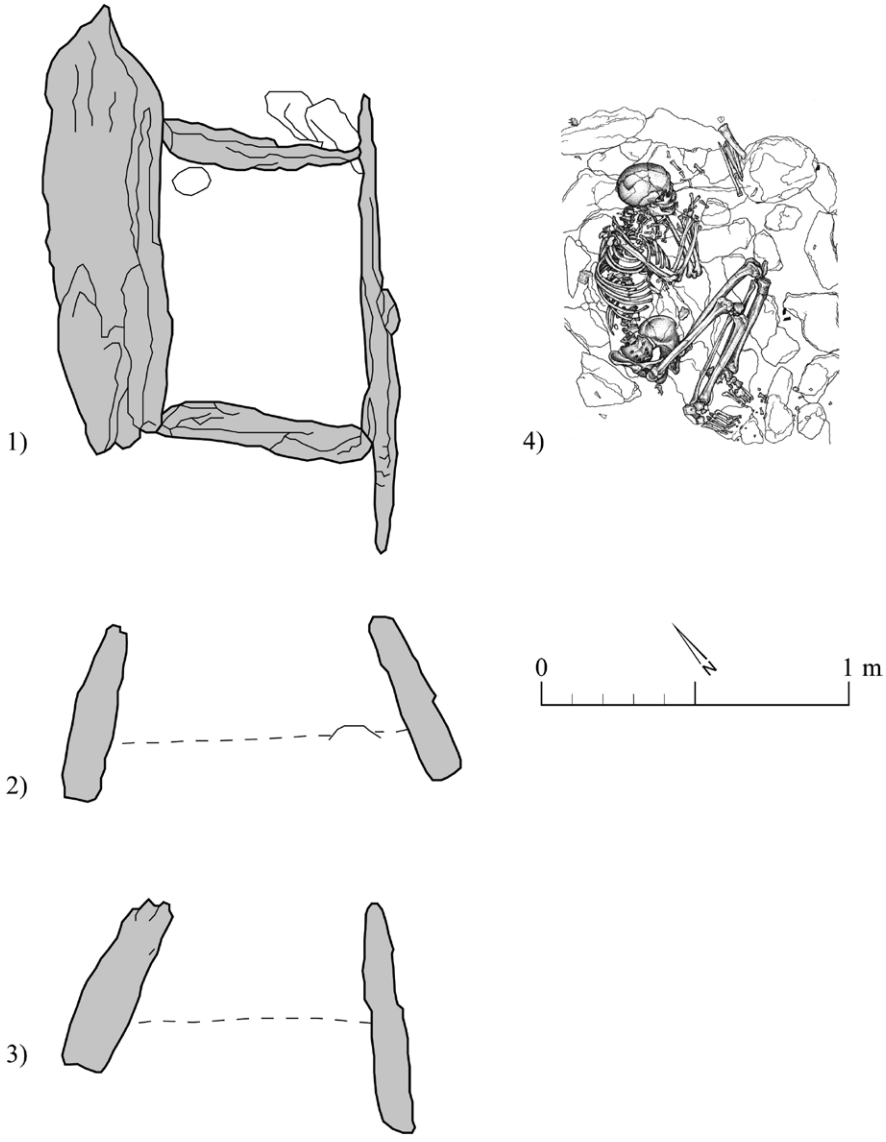


Figure 96: Lenzburg, Goffersberg. Drawings of SKG 12: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

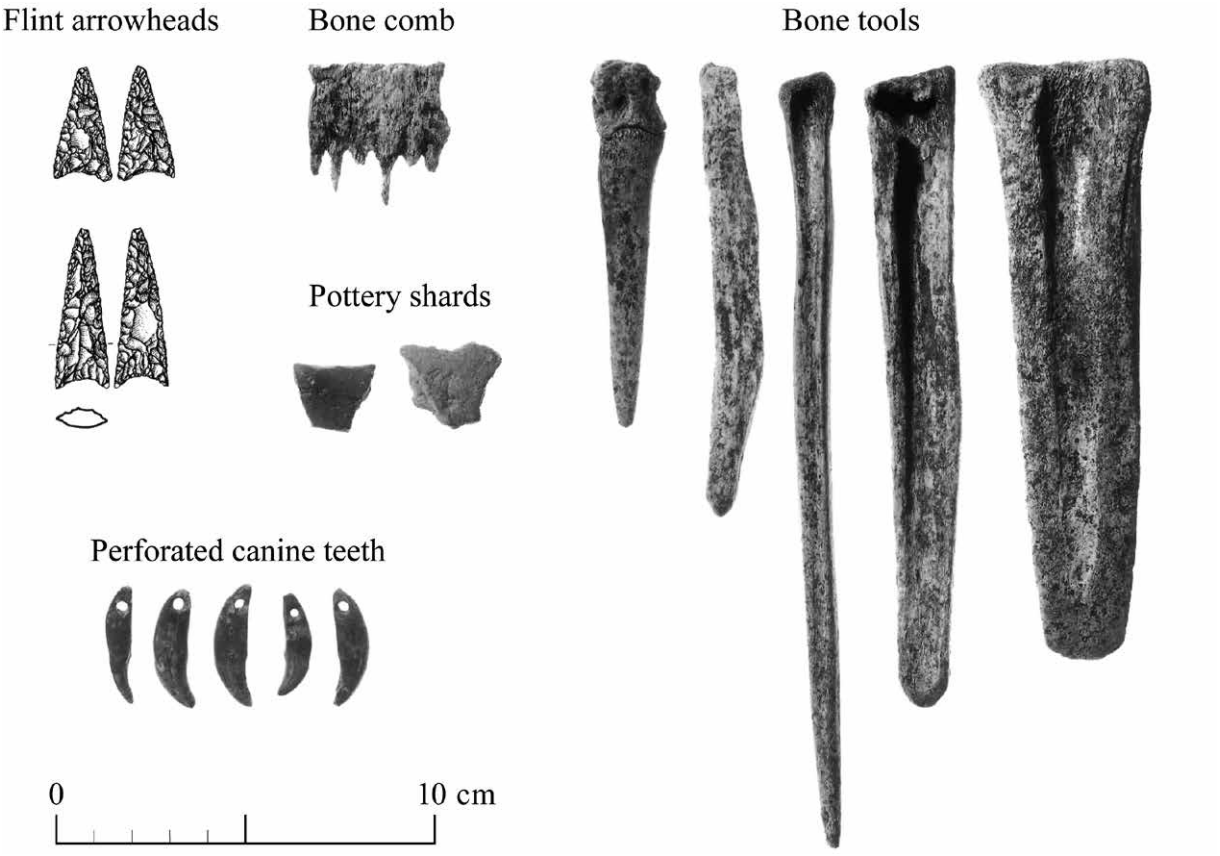


Figure 97: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 12 (source: Wyss 1998).

stones. Additional stone fragments along the northern lateral slab were assumed to be the remains of a presumed capstone. The cist was about 125 cm long and 105 cm wide and oriented in a northeast-southwest direction. This grave was prepared for the museum exhibition and therefore not completely excavated (Fig. 96.1–3).

- Human remains: The primary burial of a single individual was placed on the grave floor. It could be identified as an adult male (ca. 35 years old), lying on the left side of the body, with the lower limbs contracted (the knees at about chest level). This central positioning could indicate that this stone cist was intended for a single grave. In addition, charcoal fragments and calcined bones were sporadically found in the right half of the grave. According to Wyss, these are animal and human bones but there were too few for them to be considered cremation(s) (Fig. 96.4).
- Grave goods: Two triangular flint arrowheads, a flint blade, a rock crystal splinter with a tip (arrowhead?), five perforated canine teeth, and a peculiar bone object (identified as a comb) were found. In addition, a collection of tools made of animal bones; three awls, two chisels, and a retouching stick, were recovered. Finally, two scattered small pottery sherds and fragmented animal bones (three long bones from cattle, two from deer, and one from sheep or goat) were documented (Fig. 97).

Grave SKG 13

- Grave architecture: A rectangular stone cist formed by five or six thin lateral stone slabs. The grave floor was irregularly paved with some flat stone fragments. The cist was about 122 cm long and 86 cm wide and oriented in a northeast-southwest direction (Fig. 98.1–3).
- Human remains: Due to a separating layer of sediment, at least two burial phases can be distinguished within this grave (Fig. 101). The lower level, Level 1, consists of two superimposed rows of three individuals of primary burials, originally placed

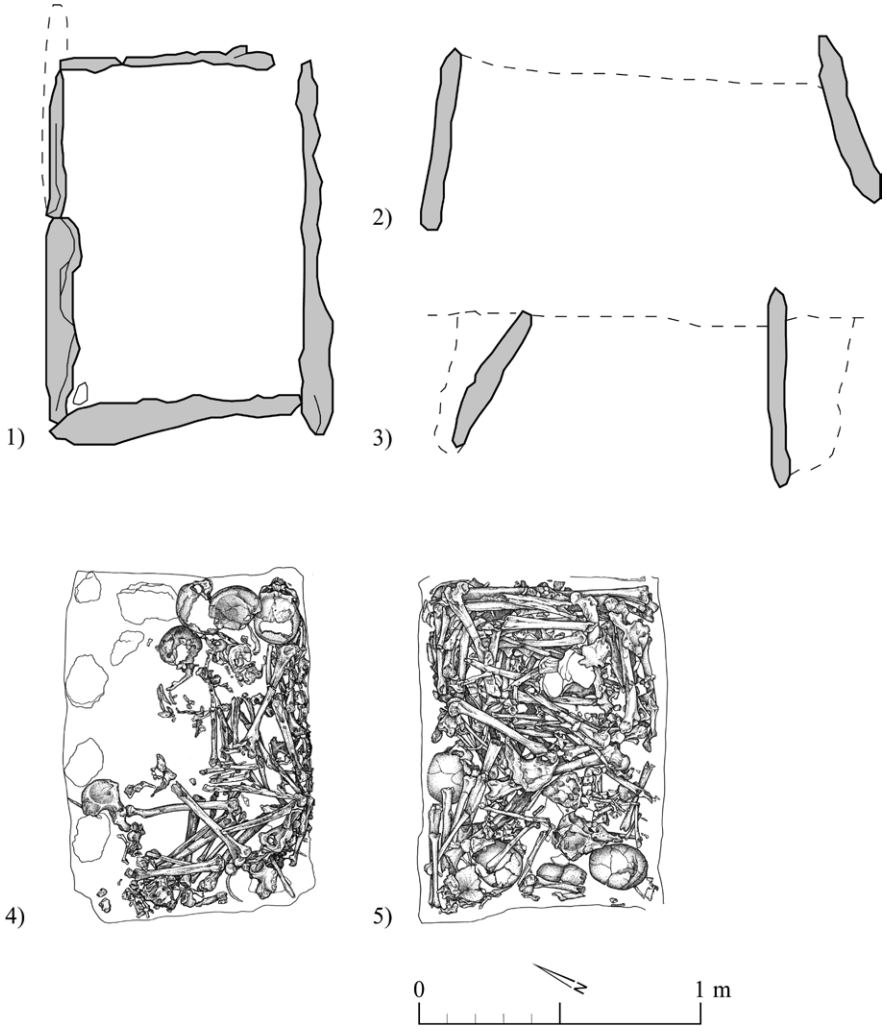


Figure 98: Lenzburg, Goffersberg. Drawings of SKG 13: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (lower level), 5) human remains within the grave (top level) (source: N. Steuri after Wyss 1998).

next to each other: Ind. 1 (ca. 9 years old), Ind. 2 (adult, probably male), and a third individual. Due to the poor state of preservation, the latter could only be identified on the basis of the mortuary shadow. At a later stage, the human remains (skull and some long bones) of Ind. 2 were pushed to the right side of the grave, over the bone fragments of Ind. 3. Above these remains followed the burial of at least three additional individuals: Ind. 4 (juvenile-adult?), Ind. 5 (juvenile), and Ind. 6 (adult). Before these six burials were covered with a layer of sediment, some skeletal elements were removed from the grave. Above a separating layer of sediment, heavily commingled skeletal fragments of at least 11 individuals were recognised. These human remains were of all age groups, and sex determination was not possible. The different (and often poor) state of preservation of the bone fragments indicates at least some to be from secondary burials. With the remains of at least 17 individuals, stone cist 13 has the highest number of burials of the entire necropolis (Fig. 98.4–5).

- Grave goods: Level 1: Six canine teeth pendants (five with intact perforation), six jet disc beads, three flint arrowheads and one elongated tool made of deer antler were found. Level 2: The rear half of a perforated axe (“Lochaxt”), eight flint arrowheads, two rock crystal fragments (tools?), two pounding stones, a dog or fox jaw, and numerous pottery fragments (n = 59) from three bottles/spherically shaped vessels with vertically and horizontally perforated knobs were recorded (Figs. 99 and 100).

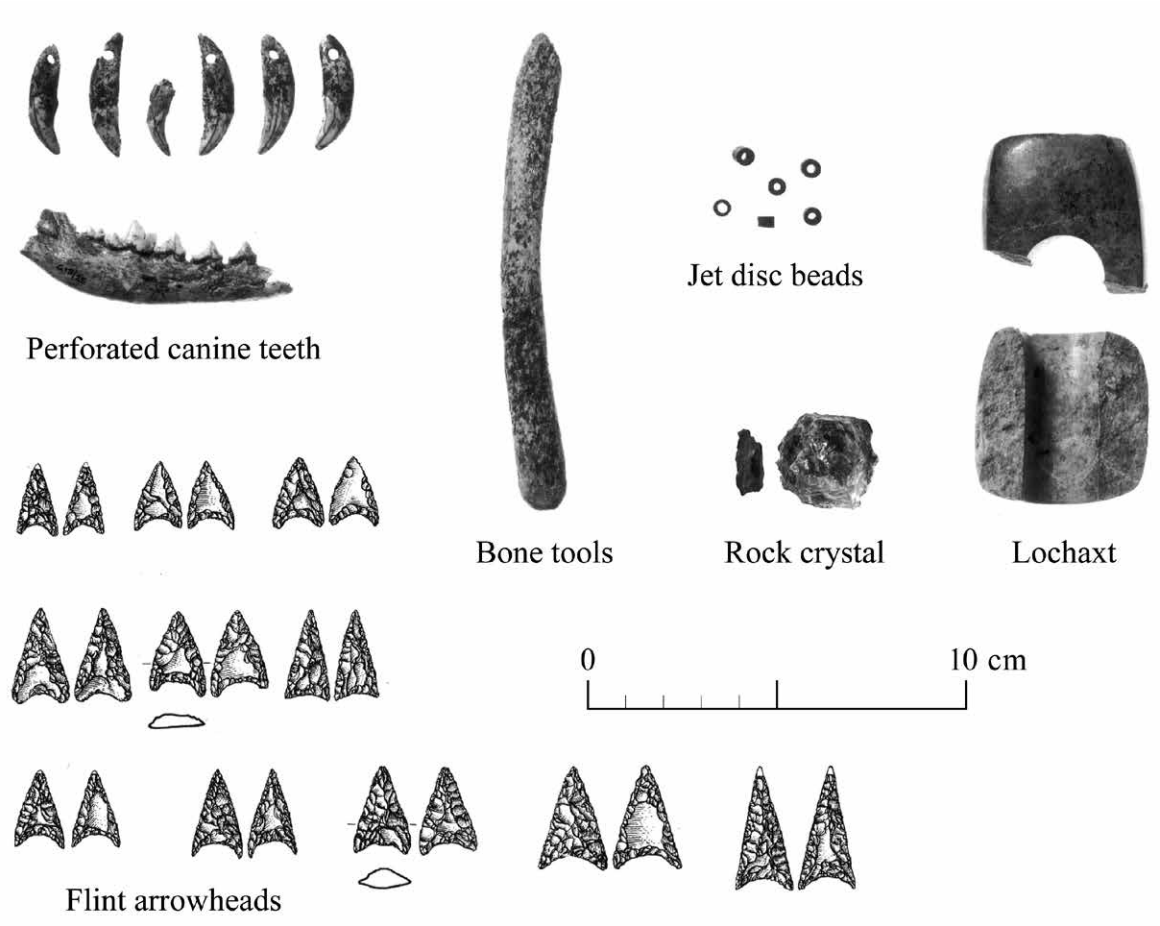


Figure 99: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 13 (source: Wyss 1998).

Grave SKG 14

- Grave architecture: A rectangular stone cist formed by what are probably four lateral stone slabs. These were in a poor state of preservation and fragmented. The grave floor was partially paved with isolated flat stone fragments. The cist was about 112 cm long and 88 cm wide and oriented in a northeast-southwest direction (Fig. 102.1–3).
- Human remains: The grave consists of five disturbed primary burials in two superimposed layers of individuals next to each other (Fig. 104). On the grave floor, Ind. 1 (adult, female), Ind. 2 (6- to 8-year-old), and Ind. 3 (about 3 years old) were found, and, directly above, Ind. 4 (adult, male) and Ind. 5 (17- to 21-year-old, female). They were placed on the left side of their bodies, with bent arms and the lower limbs heavily contracted (the knees at chest level and feet by the pelvis) (Fig. 102.4).
- Grave goods: About 72 jet disc beads were documented (Fig. 103).

Grave SKG 15

- Grave architecture: The structure is heavily disturbed and only fragmented pieces of two lateral slabs remain (Fig. 105.1).
- Human remains: The heavily disturbed and badly preserved bones from at least four individuals were found: Two adults and two young children (Fig. 105.2).
- Grave goods: Four pottery fragments, of which one was a rim sherd, were found (Fig. 106).

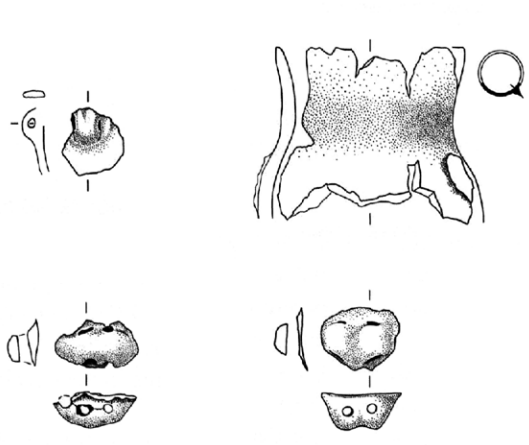


Figure 100: Lenzburg, Goffersberg. Drawings of the ceramic fragments from SKG 13 (source: De Capitani 2007).

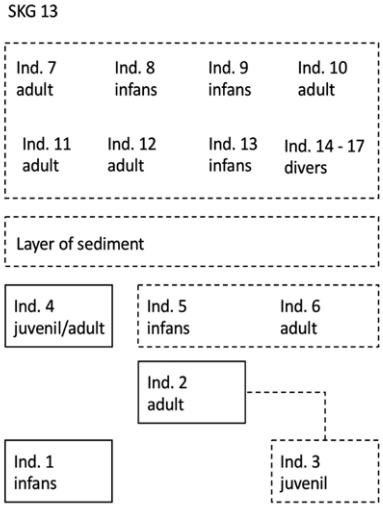


Figure 101: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 13.

Grave SKG 16

- Grave architecture: The structure was disturbed, with the southeastern lateral slab missing and the others fragmented. The grave floor was paved with stone fragments of different sizes. The cist was about 110 cm long and 80 cm wide and oriented in a northeast-southwest direction (Fig. 107.1).
- Human remains: These were disturbed, respectively incomplete, and originated from at least three individuals: two adults and one juvenile (Fig. 107.2).
- Grave goods: Two flint arrowheads and the base fragment of a deer antler were found (Fig. 108).

Grave SKG 17

- Grave architecture: A rectangular stone cist formed by four lateral stone slabs. Fragments of the capstone were still present, and the grave floor was carefully paved with small to large stones. The cist was about 115 cm long and 90 cm wide and oriented in a northeast-southwest direction (Fig. 109.1–3).

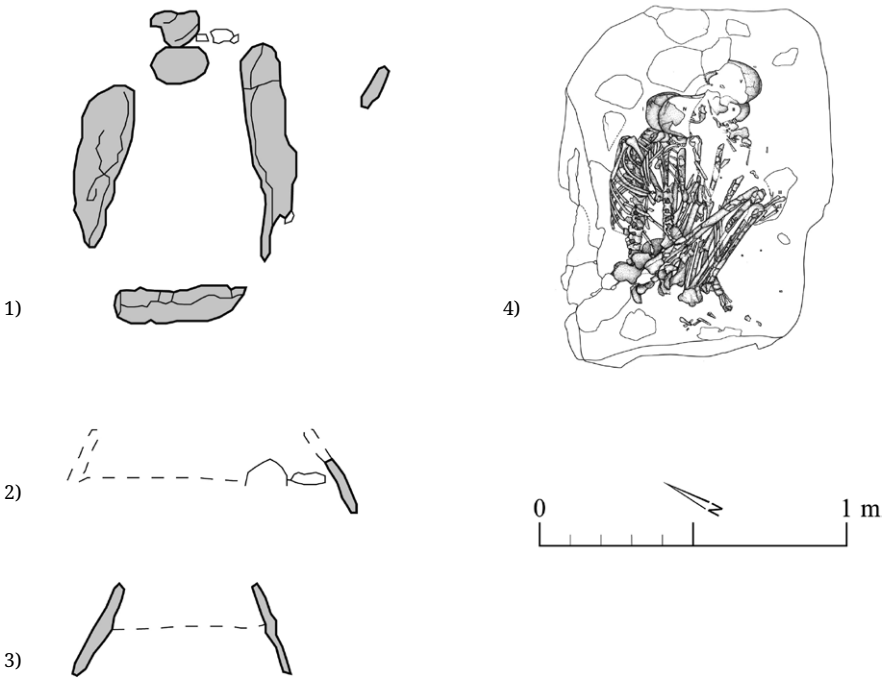


Figure 102: Lenzburg, Goffersberg. Drawings of SKG 14: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (source: N. Steuri after Wyss 1998).

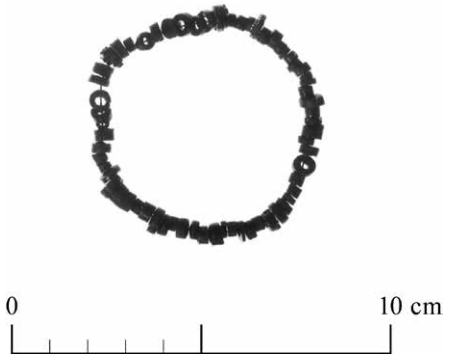


Figure 103: Lenzburg, Goffersberg. Picture of the jet disc beads from SKG 14 (source: Wyss 1998).

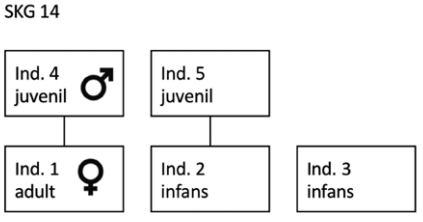


Figure 104: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 14.

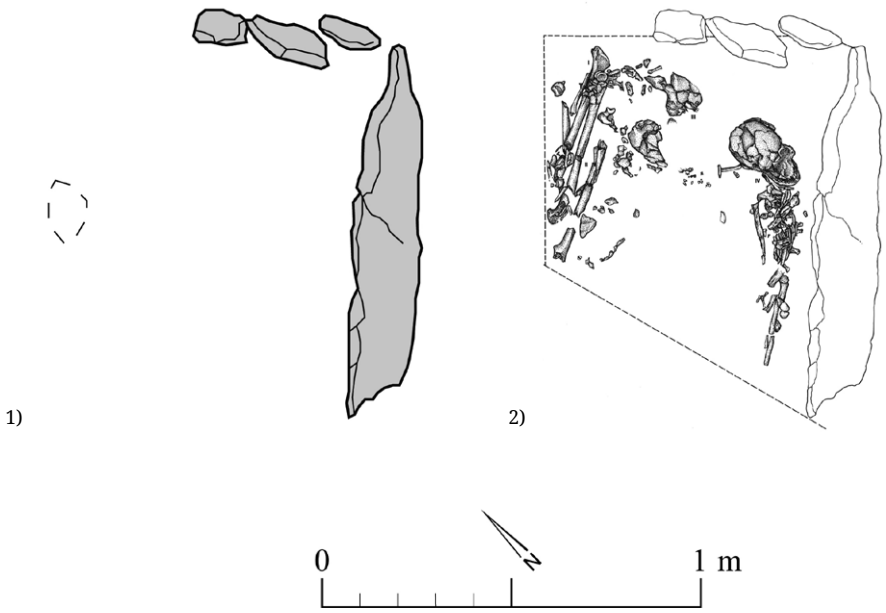


Figure 105: Lenzburg, Goffersberg. Drawings of SKG 15: 1) top view of the grave structure, 2) human remains within the grave (source: N. Steuri after Wyss 1998).

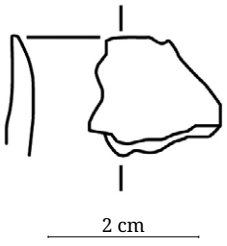


Figure 106: Lenzburg, Goffersberg. Drawing of a pottery sherd from SKG 15 (source: N. Steuri after De Capitani 2007).

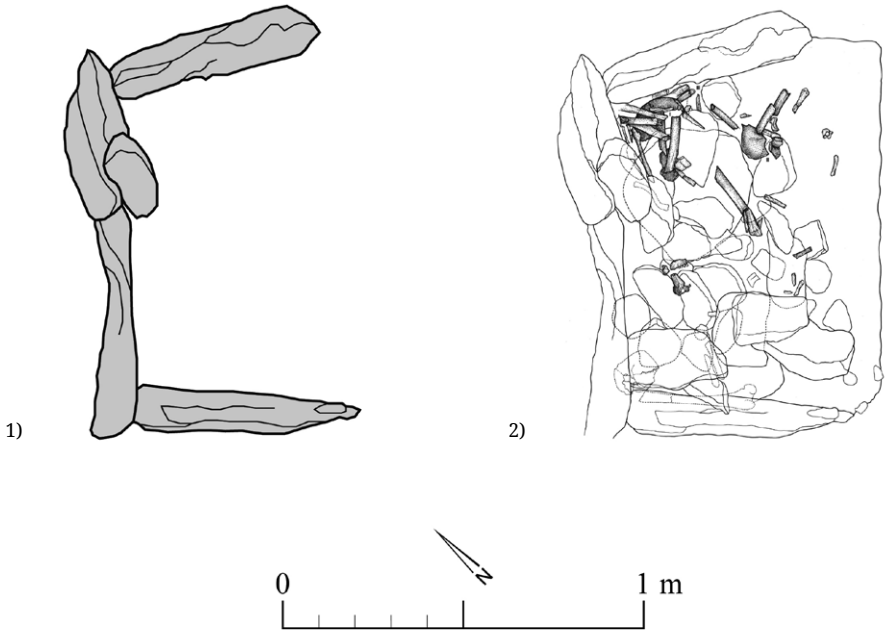


Figure 107: Lenzburg, Goffersberg. Drawings of SKG 16: 1) top view of the grave structure, 2) human remains within the grave (source: N. Steuri after Wyss 1998).

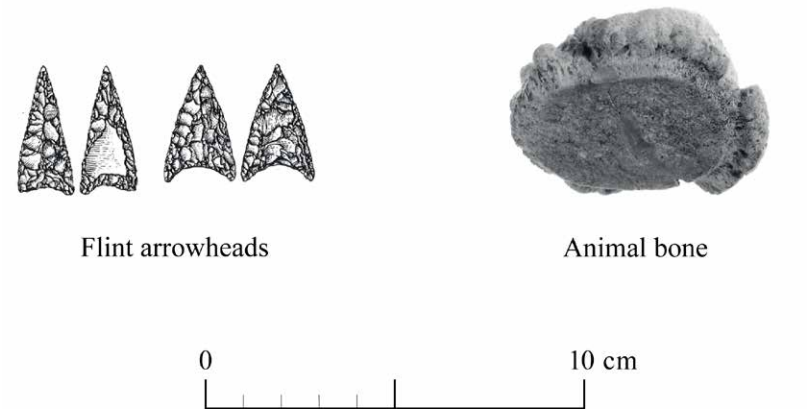


Figure 108: Lenzburg, Goffersberg. Picture and drawings of grave goods from SKG 16 (source: Wyss 1998).

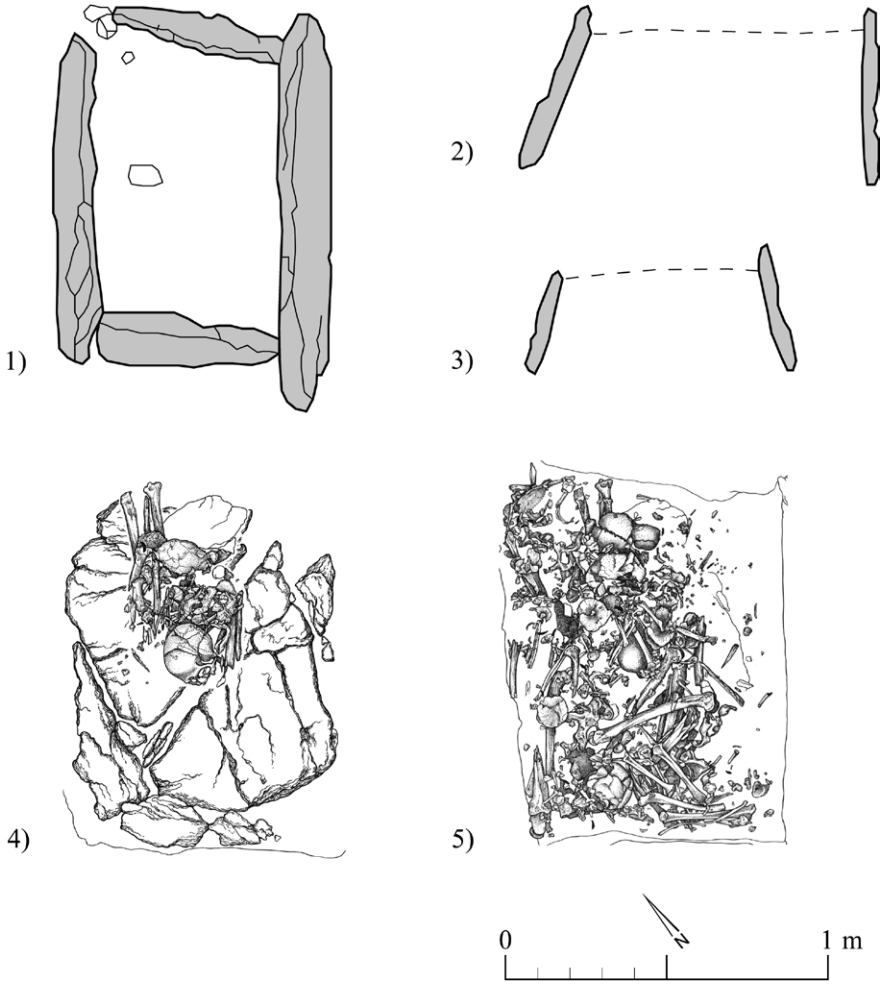


Figure 109: Lenzburg, Goffersberg. Drawings of SKG 17: 1) top view of the grave structure, 2) side view (long sides), 3) side view (narrow sides), 4) human remains within the grave (lower level), 5) human remains within the grave (top level) (source: N. Steuri after Wyss 1998).

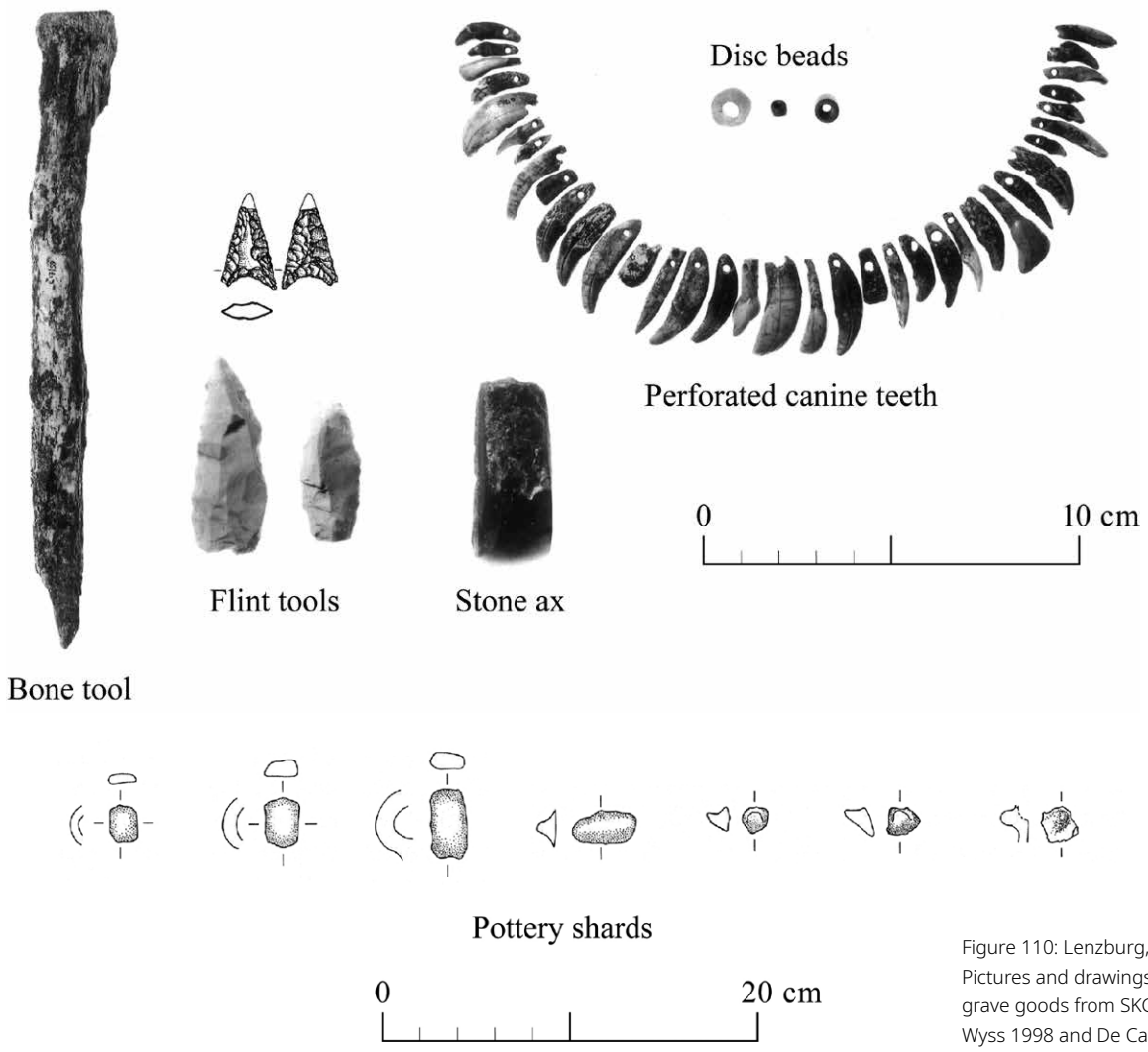


Figure 110: Lenzburg, Goffersberg. Pictures and drawings of the grave goods from SKG 17 (source: Wyss 1998 and De Capitani 2007).

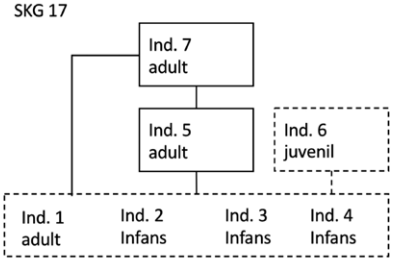


Figure 111: Lenzburg, Goffersberg. Sequence of burials, as well as age at death and sex determinations of grave SKG 17.

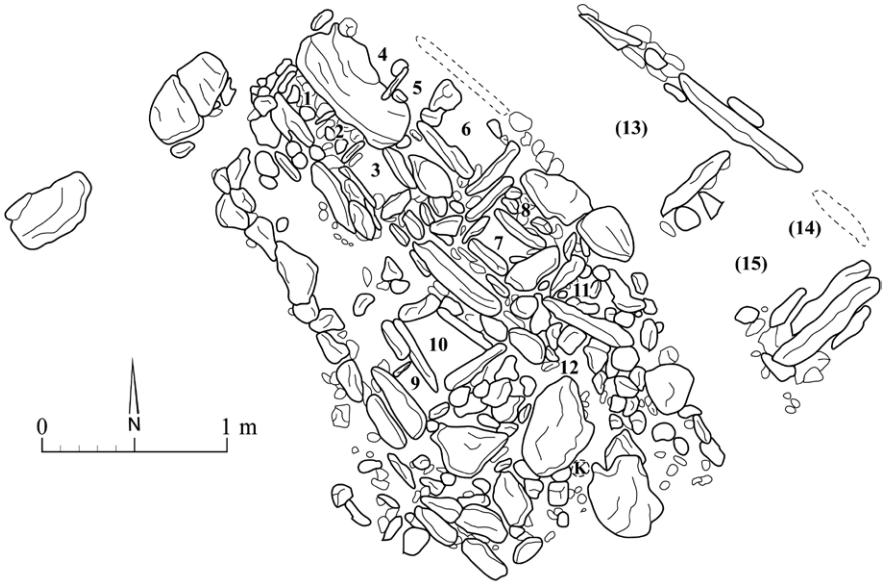
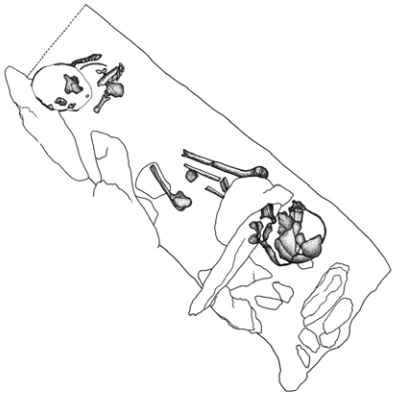


Figure 112: Lenzburg, Goffersberg. Map of the funerary monument (source: N. Steuri after Wyss 1998).

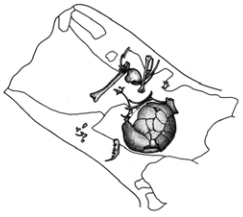
Figure 113: Lenzburg, Goffersberg. Drawings of the human remains within the chambers of the funerary monument (source: Wyss 1998).

Chamber 3



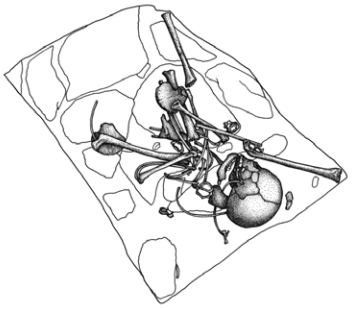
Chamber 4 and 5

Chamber 6



Chamber 7

Chamber 9



Chamber 10

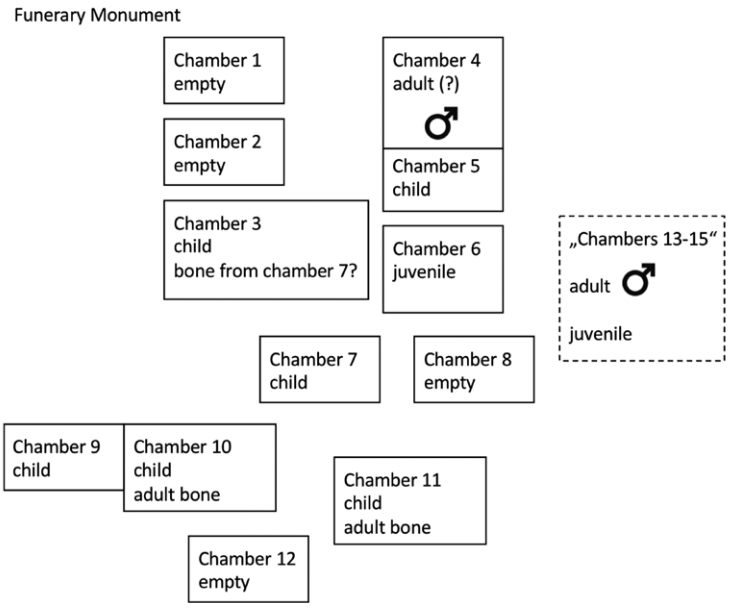


Figure 114: Lenzburg, Goffersberg. Age at death and sex determinations within the chambers of the funerary monument.

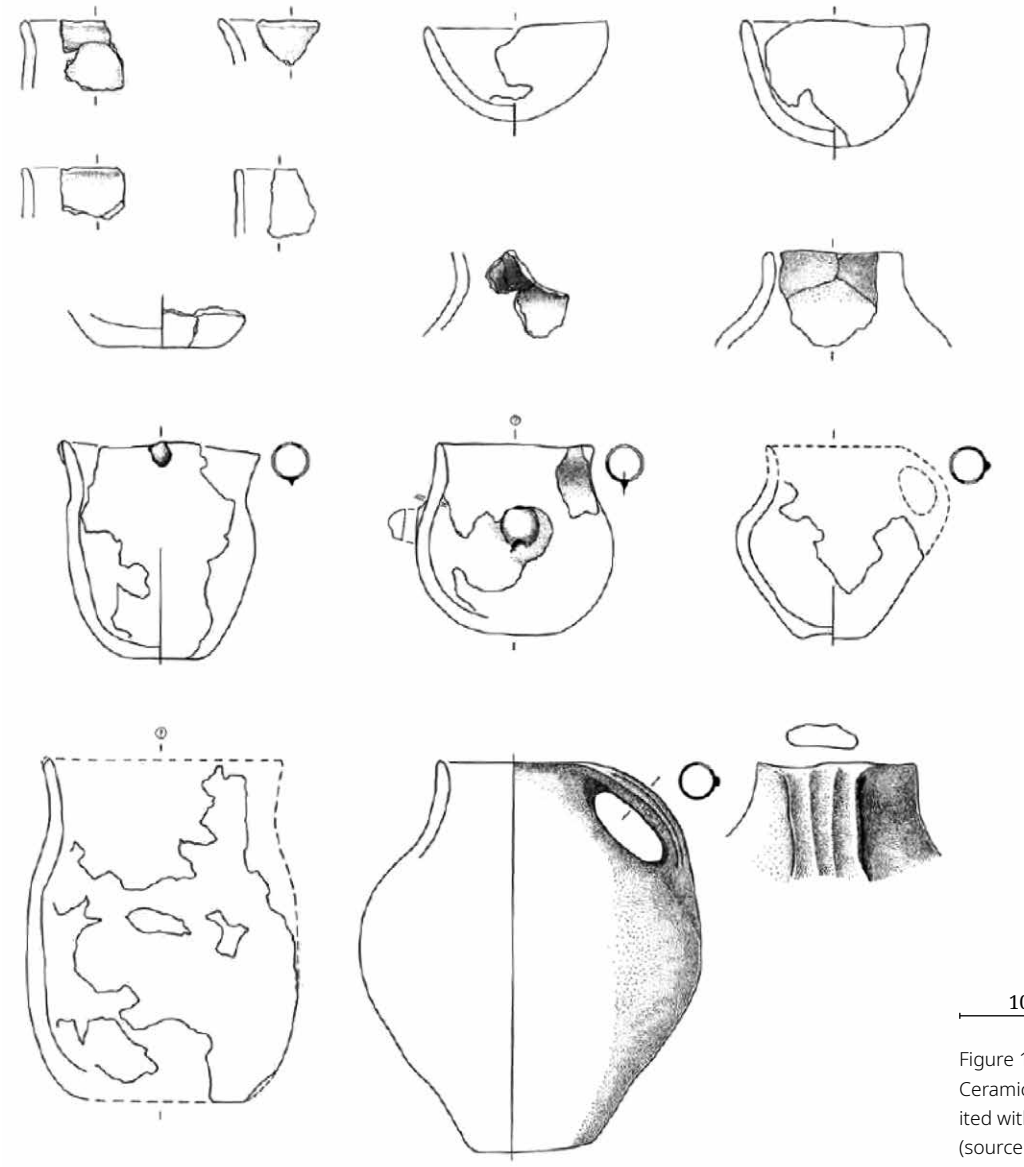


Figure 115: Lenzburg, Goffersberg. Ceramic vessels and sherds deposited within the funerary monument (source: De Capitani 2007).

- Human remains: The fragmented bones were commingled and in a poor state of preservation. Two burial phases could be distinguished and consisted of at least seven individuals (Fig. 111). The remains of Ind. 1 (adult, male?), Ind. 2 (6- to 7-year-old), Ind. 3 (ca. 9-year-old), and Ind. 4 (6–9 months) appeared to have been pushed to the northeastern side of the cist to make space for an adult male (Ind. 5) and a juvenile child (Ind. 6). In the centre of the grave, above Ind. 5, followed the burial of Ind. 7 (adult, male?) on the left side of the body with the legs contracted (Fig. 109.4–5).
- Grave goods: About 50 perforated animal teeth (from dogs, cattle, sheep/goats, pigs, and deer) and three stone disc beads were interpreted as components of a necklace. In addition, a small stone axe blade, a flint arrowhead, a flint scraper, four flint blades, a tool made of animal bone, and numerous small pottery fragments of several vessels were documented (Fig. 110).

Funerary monument

- Grave architecture: This large, complex structure consisted of stacked stone slabs with a diameter of about 6 m. Within the centre of this monument, at least 12 small stone chambers formed by placed stone slabs were found. The individual chambers were 50–60 cm long and 30–40 cm wide and oriented in a northwest-southeast direction. They were partially interconnected; for example, three lateral stone slabs were added southwest of chamber 10 to form chamber 9. The chambers were covered by flat capstones (in the case of chambers 9 and 10, multiple smaller stone slabs covered the graves). The northeastern area of the structure was disturbed by modern construction work. Here, at least three additional chambers (numbers 13–15) were recognised based on single stone slabs, trenches, and bone fragments (of an adult and juvenile individual). In the northwestern area of the structure, a zone was enclosed with a wall made of piled stone slabs, and it was suspected that further chambers were planned there (Fig. 112).
- Human remains: The chambers generally contained single burials of subadult individuals (found within chambers 3, 5, 6, 7, and 9). Additional bone fragments of adults were only found within two chambers. Specifically, the remains of an 8-year-old and a single finger bone of an adult individual were found within chamber 10. Similarly, in chamber 11, a few bones of a 1- to 2-year-old infant and a single finger bone of an adult individual were recovered. In four chambers (1, 2, 8, and 12), no human remains could be detected. Either these graves had not been used, cleared out, or the bones were not preserved. Similar to the individuals placed in the stone cist graves, the primary burials in the chambers were lying on their left side in a crouched position. The skulls were on the southeastern side of the chamber

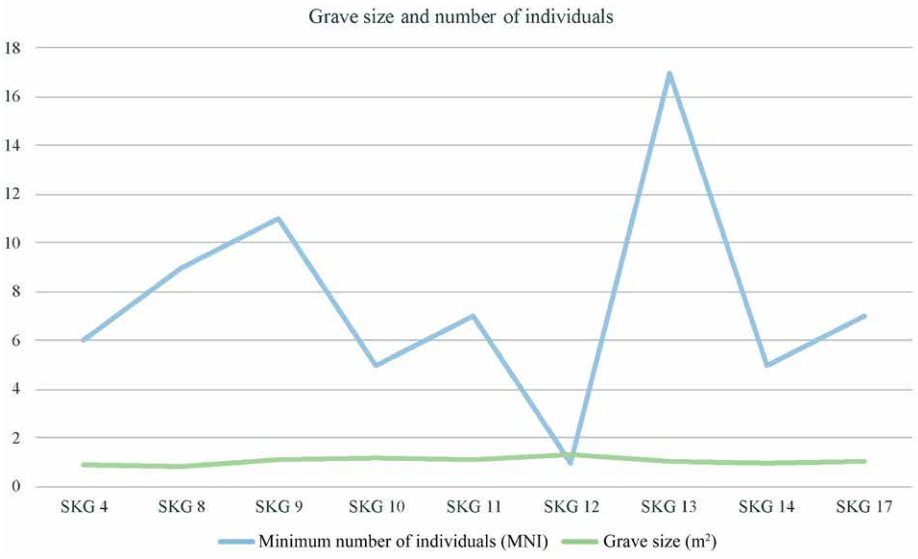


Figure 116: Lenzburg, Goffersberg. Graph depicting the relation of MNI and grave size.

(except for chamber 4 in the northwest) and thus have a different orientation than those of the stone cists. Secondary burial practices in the form of bone depositions are assumed for chambers 3, 5, and 11. The human remains are generally in a poor state of preservation and many exhibited disturbances (Figs. 113, 114).

- Grave goods: The individual chambers of the funerary monument contained almost no grave goods. Animal bone tools were found in the form of an awl in chamber 11, and an object of axe blade-like form from chamber 12. Fragments of a small bowl or cup with a rounded base were found within chamber 13, and some pottery fragments

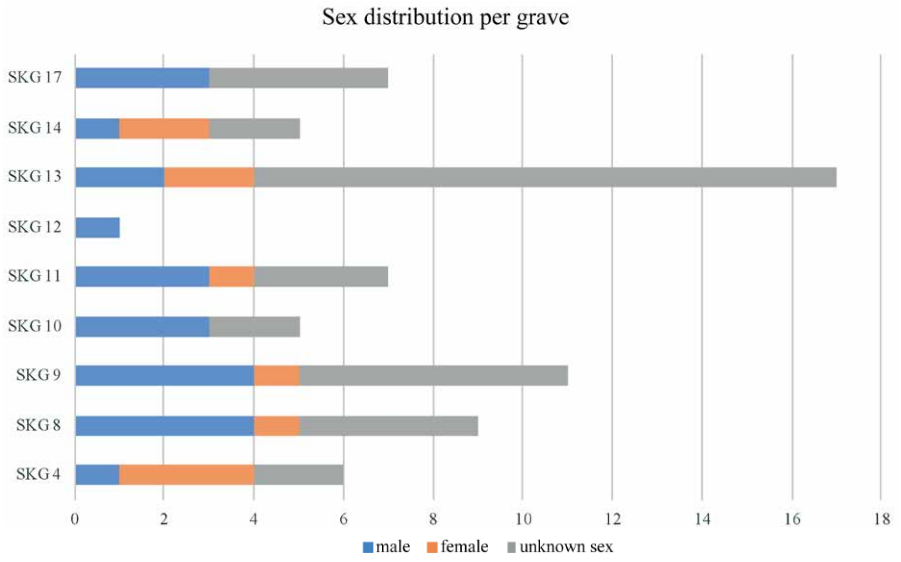


Figure 117: Lenzburg, Goffersberg. Graph depicting the sex distribution within collective graves.

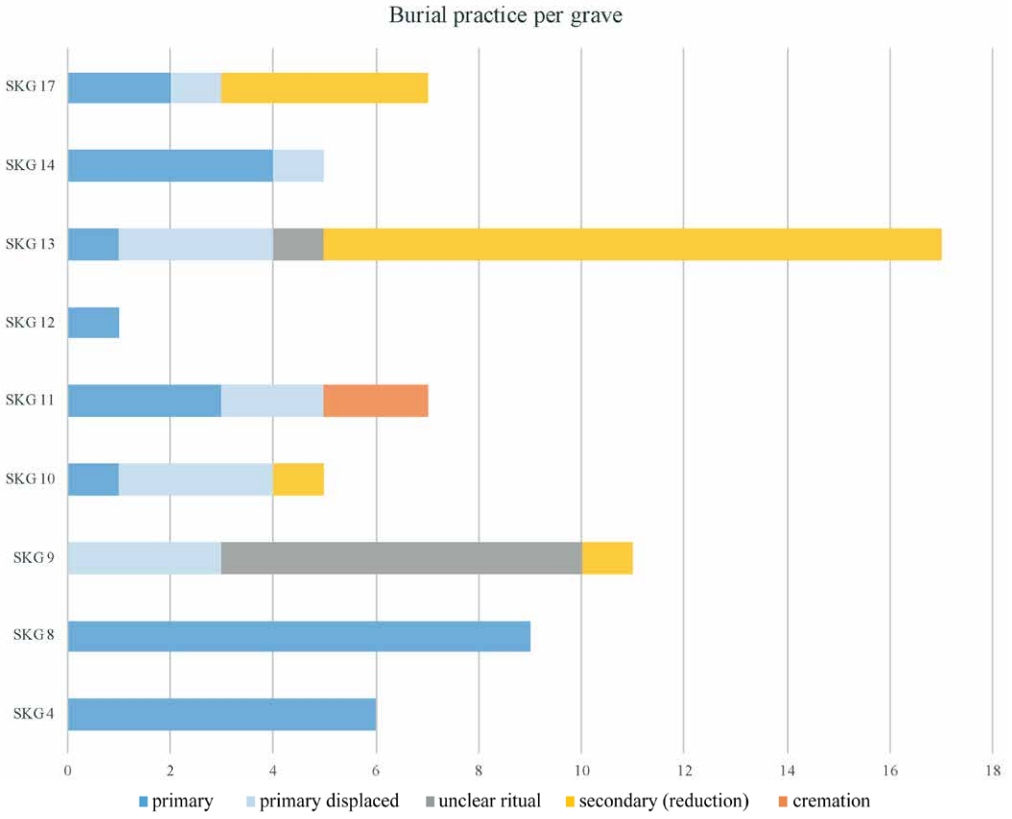


Figure 118: Lenzburg, Goffersberg. Graph depicting the assumed burial practice of individuals within collective graves.

were found in the sediment over chambers 4 and 5, and one with silt application. A deposition of pottery fragments was found under the stone slabs at the southeastern edge of the monument. The sherds could be partially reconstructed into almost complete vessels and originated from at least 12 ceramic objects, such as pots, cups, and a characteristic jar (Fig. 115).

V. Burial practice

The primary burials of the necropolis of Lenzburg were generally buried on the left side of the body with the legs flexed and oriented in a northeast-southwest direction. Secondary burial rituals could be observed in the form of bone depositions, reductions, and a few cremations. The analysis on the basis of different parameters could reveal differences concerning burial practices. For this investigation, only the stone cist graves that were considered undisturbed by modern construction work were included. These were graves SKG 4, 8–14, and 17 (n = 9):

- The grave size (formed by the lateral stone slabs) of these nine stone cists was compared with the minimum number of buried individuals (MNI). It became evident that the grave size was not influenced by the number of burials. The mean value of the grave size is 1.056 m^2. The largest deviations from this mean were the smallest grave, SKG 8 (0.824 m^2), and the largest stone cist, SKG 12 (1.313 m^2) (Fig. 116). The specific burial practice needs to be kept in mind, as primary burials require more space than secondary bone depositions, for example.
- Sex and age-at-death distribution: Of the 68 considered individuals, almost one-third (n = 22) could be determined as male and only 14.7% (n = 10) as female. For 53% (n = 36), no sex determination was possible. Regarding the distribution of specific graves, SKG 10 and 17 had exclusively male individuals, while a majority of the burials within SKG 4 and SKG 14 were female (Fig. 117). This distribution provides evidence for a deliberate separation based on sex for at least some stone cist graves. In contrast, there is almost no evidence for differentiation in regards to age class, as most graves show an almost balanced ratio between adults and subadult individuals.
- In regards to burial practices, four stone cists (SKG 4, 8, 12, and 14) contained exclusively primary burials (including displaced primary burials). In contrast, graves SKG 13 and 17 contained a majority of assumed secondary burials. Cremations were only found within SKG 11 and are probable for SKG 12 (Fig. 118). This could indicate a different, conceptual use of specific stone cists within a necropolis.
- Regarding the specific positioning of individuals within the stone cists, only the data of undisturbed primary burials were considered (n = 39). This showed that male indi-

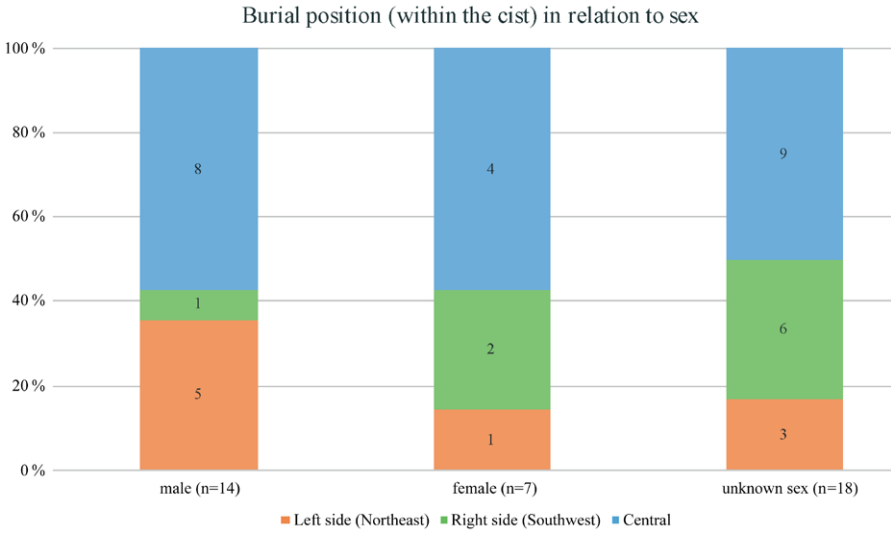


Figure 119: Lenzburg, Goffersberg. Graph depicting the relation of burial position and sex within graves.

viduals were more frequently buried on the northwestern side of the grave (at 36%), while only one male was found on the southeastern side. In contrast, 29% of the female individuals were found on the southeastern side of the grave and only one on the northwestern side. For both sexes, the proportion of individuals buried in a central position within the stone cist is identical, at 57% (Fig. 119). Whether these data allow us to draw conclusions on different treatments of individuals based on sex within the burial practices is to be discussed.

In summary, based on sex, a possible selection of adult primary burials could be detected (within the undisturbed stone cists). In regards to specific positioning within the graves, a differentiation between males and females can be assumed. The actual size of the stone cists seems to have had a certain norm, since it was not influenced by the number of buried individuals or different burial practices. In this context, significant differences in burial practices could be observed among the individual graves.

VI. Grave goods

Comparatively, the stone cist graves of the Lenzburg necropolis contained a high number of grave goods. They consist of typical ornamental objects, such as jet disc beads (found in SKG 4, 5, 8, 13, and 14) or perforated animal teeth (found in SKG 8, 12, 13, and 17). The tools consist of two perforated stone axes from SKG 4 and 13, two small axe blades from SKG 11 and 17, and a large number of flint arrowheads and animal bone objects. Rock crystal was only found within the single burial of SKG 12.

Considering the sparsity of pottery within Neolithic stone cist graves, here, the ceramic fragments from SKG 13 and 17, as well as the deposit within the funerary monument, will be covered in more detail:

- Of the pottery fragments found within SKG 13 (n = 59), four show ornamental elements. The rim fragment of an S-shaped vessel shows traces of a broken-off handle or knob on the shoulder. Further, two sherds have knobs with multiple lugs, one fragment has double vertical perforations, and one has triple. Finally, one sherd had a horizontally perforated knob.
- Eight rim sherds found within SKG 17 were too fragmented to allow for the reconstruction of the original vessel shape. Additionally, three small handle fragments and chipped knob fragments were found.
- The pottery deposited in a pit within the funerary monument consists of various ceramic vessels. Two S-shaped pots with a flattened base could be reconstructed: one with a knob on the rim and one with a vertically perforated knob on the shoulder. Further, a small bowl or cup with a rounded bottom (similar to the one found in chamber 13), and several sherds from the rims of two vessels with narrow openings, probably bottles, were documented. The typologically most important was a so-called Pfyn-type jug that could be completely reconstructed. The surface is covered with silt and it has a flat bottom, bulbous wall, and narrow opening. The wide handle runs from the opening to the shoulder of the vessel and is decorated with three grooves. Below the base of the handle, one section (of about 4 by 3 cm) is covered/repaired by birch tar. Additionally, a handle was reconstructed from a second heavily fragmented vessel.

4.6.2. Däniken, Studenweid

I. Context

The site, consisting of five stone cist graves, is located in the Aare Valley, at the northern foot of the Engelberg (702 m in altitude) and about 1 km south of the Aare River (also some 20 km east of Lenzburg). The “Studenweid” (at an altitude of 404 m) is a river terrace about 1000 m long and 400 m wide and situated between the municipalities of Dulliken (Solothurn, Switzerland) and Däniken (Solothurn, Switzerland).

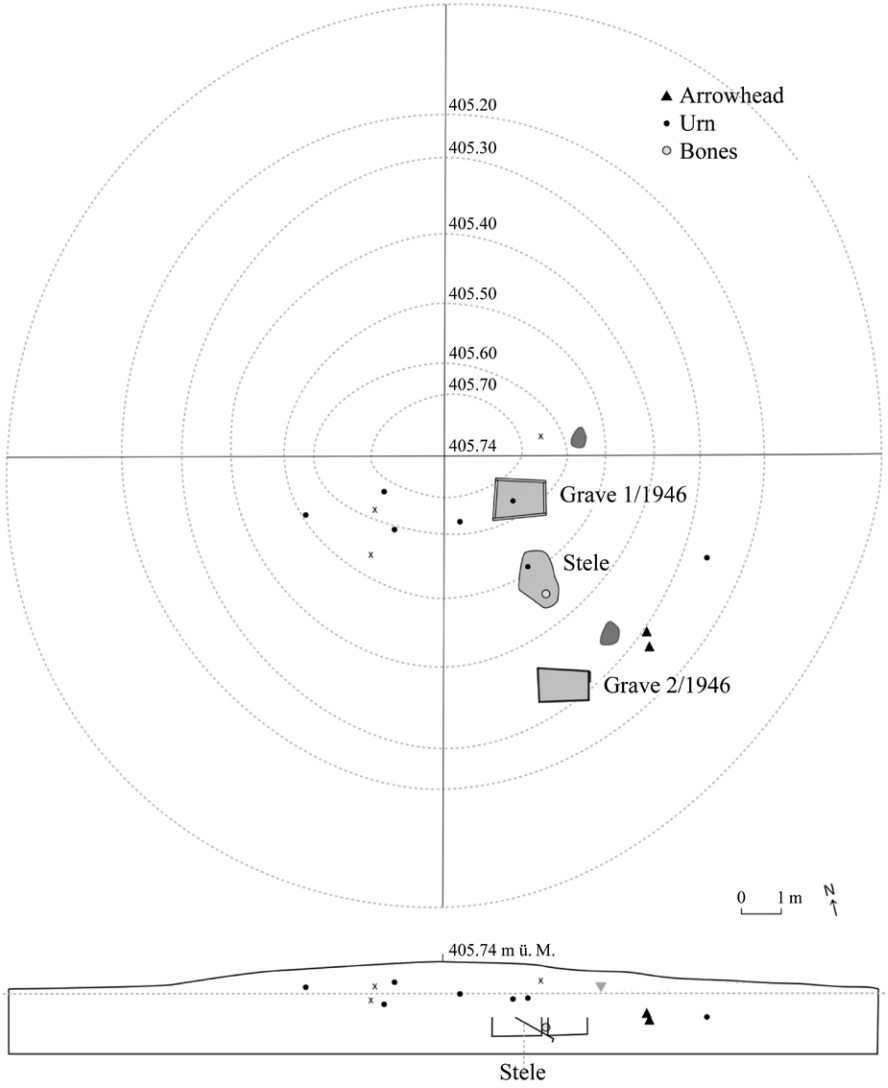


Figure 120: Däniken, Studenweid. Map of the graves from 1946 (source: Steuri and Hafner 2022).

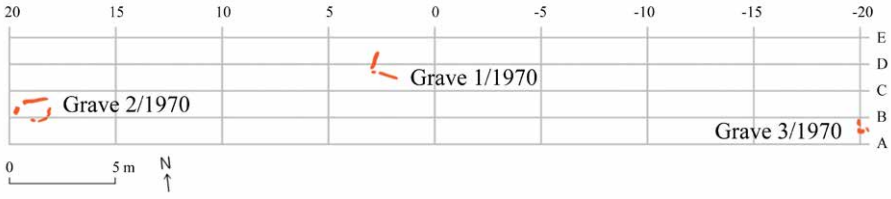


Figure 121: Däniken, Studenweid. Map of the graves from 1970 (source: Steuri and Hafner 2022).

II. Background

About 150 m in front of the northeastern corner of the "Studenweid" river terrace, three potential burial mounds were discovered in 1943. Two are about 20 m in diameter and a little over 70 cm high (called burial mounds 1 and 2), while the third, natural mound was just a few centimetres aboveground (Schweizer, 1947, 184–185). The subsequent excavation campaigns of burial mound 1 from May 13 to June 2, 1946, revealed four urns grouped around the centre of the mound, as well as pottery and smaller bronze finds from the Hallstatt period. About 130 cm below the top of the burial mound, or 50 cm below the modern surface level, a "Neolithic burial zone" with two stone cist graves was

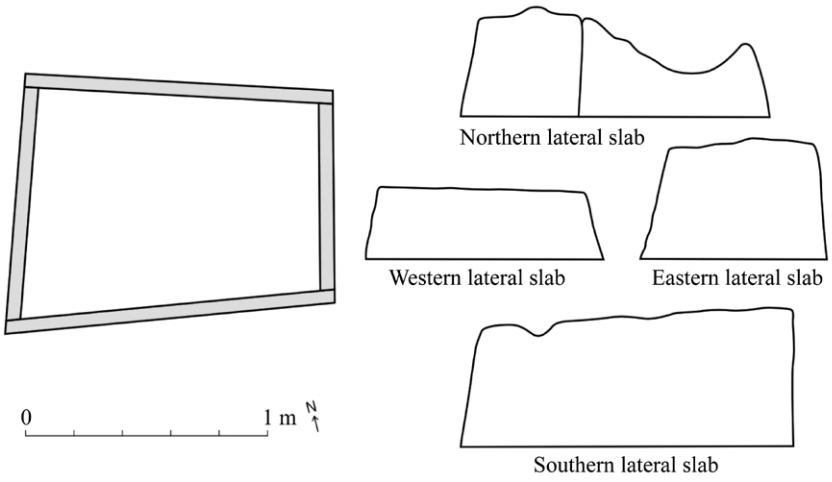


Figure 122: Däniken, Studenweid. Drawing of the grave structure from 1/1946 (source: Steuri and Hafner 2022).

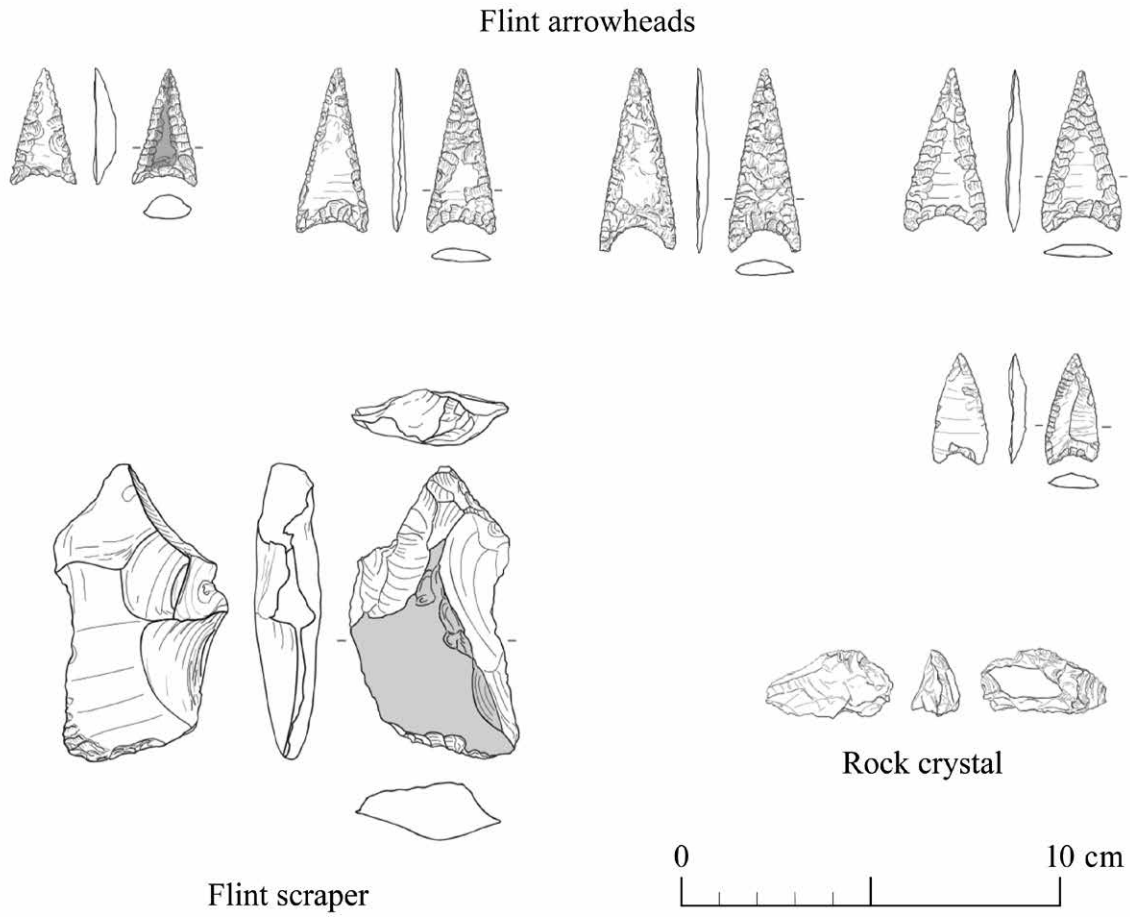


Figure 123: Däniken, Studenweid. Drawing of the grave goods from 1/1946 (source: Steuri and Hafner 2022).

Figure 124: Däniken, Studenweid. Drawing of the grave structure from 2/1946 (source: Steuri and Hafner 2022).

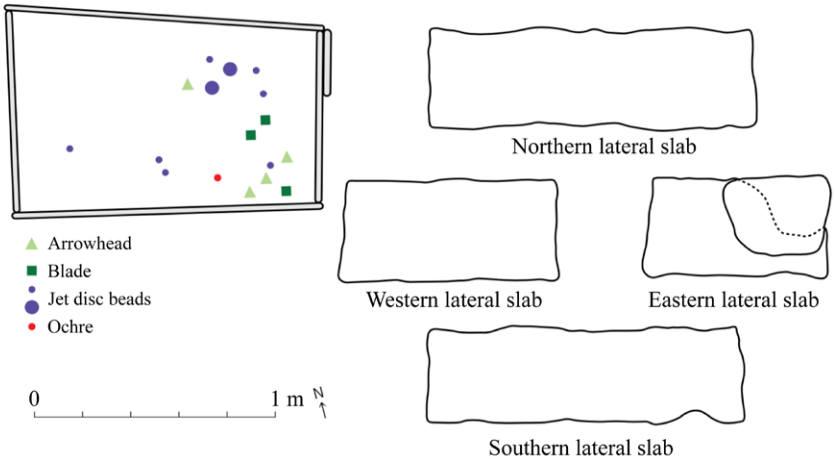
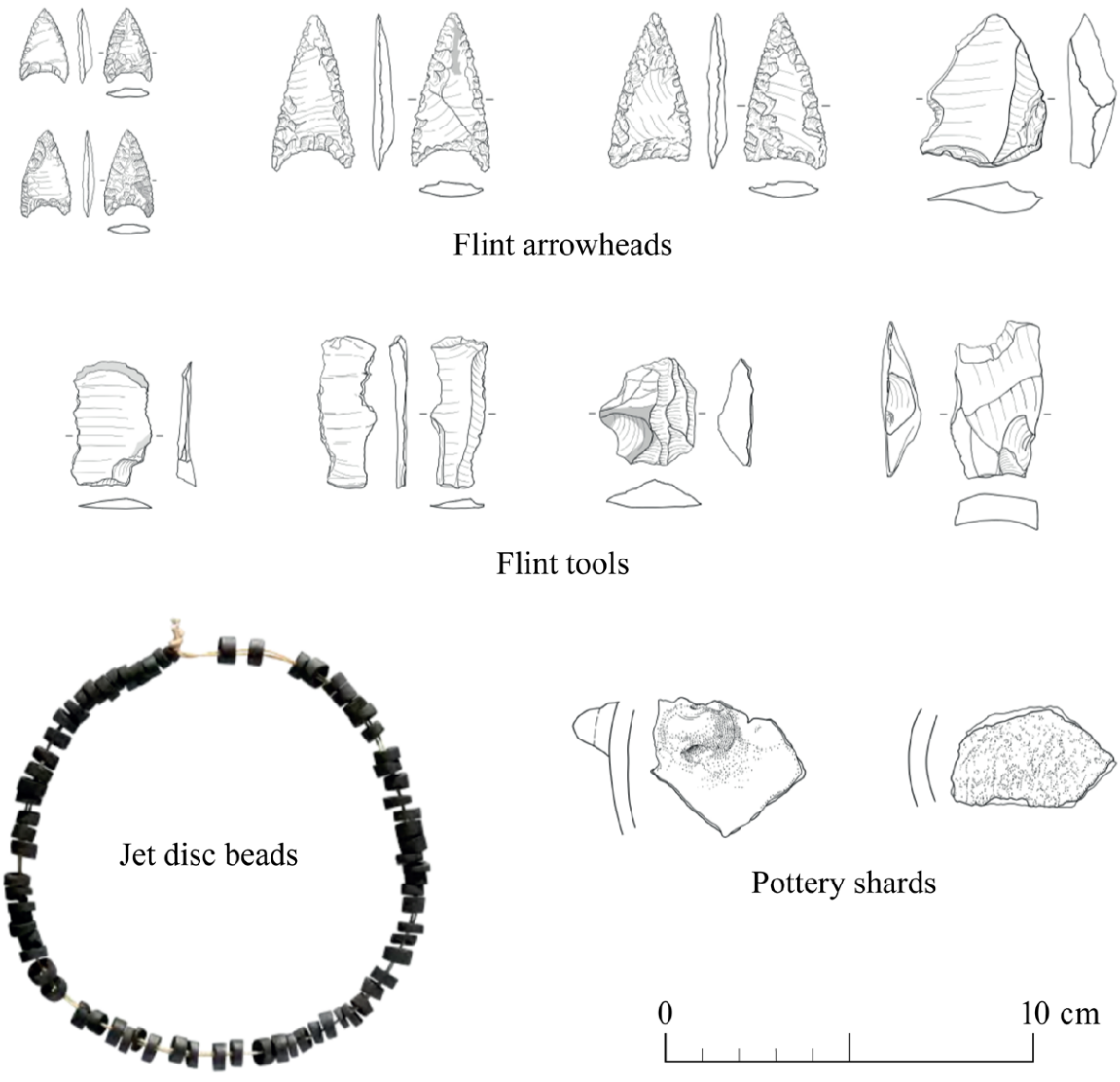


Figure 125: Däniken, Studenweid. Drawing of the grave goods from 2/1946 (source: Steuri and Hafner 2022).



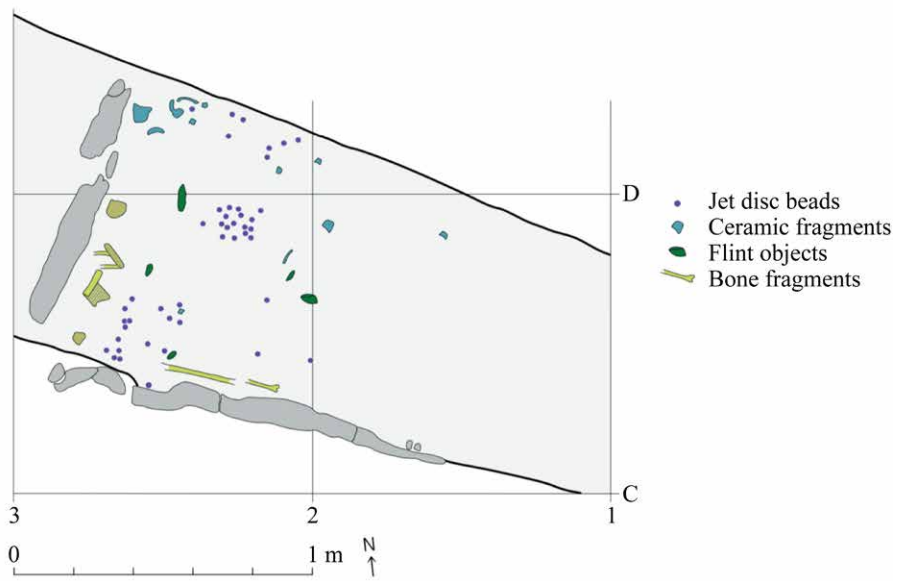


Figure 126: Däniken, Studenweid. Drawing of the grave structure from 1/1970 (source: Steuri and Hafner 2022).

discovered. Grave 1/1946 was located not far from the centre of the burial mound, and grave 2/1946 was about 4 m southeast of it (Schweizer, 1947, 185–189) (Fig. 120).

Burial mound 2 was excavated in 1947 and again, urns and Hallstatt period objects were found. No Neolithic features were discovered underneath. Analysed soil samples showed that mound 2 had been artificially raised and underneath lay the in situ soil, which also corresponded to the level of the Neolithic graves under burial mound 1 (Laur-Belart, 1947, 53–56; Schmid, 1948). This indicates that the stone cists were in no connection to the mounds raised during a later period.

A possibly similar discovery was made in Pfäffikon, Speckholz (Zurich, Switzerland), where, in 1892, three stone cist graves were found under a burial mound of the Hallstatt period (Altorfer, 2010, 195; Hauser, 1993, 106).

In 1970, three additional stone cist graves were discovered about 200 m southwest of burial mound 1. Graves 1/1970 and 2/1970 were discovered during gravel mining. The subsequent excavation took place from September 16 to October 29, 1970. During this time, gravel mining continued around the excavation site, and in the process, a third, heavily disturbed stone cist (3/1970) was discovered about 20 m east of grave 1/1970 (Dubuis and Osterwalder, 1972, 296–297) (Fig. 121).

III. Spatial organisation of the necropolis

Regarding the extent of the site, it is doubtful that the two groups of stone cist graves (discovered in 1946 and 1970) belonged to the same necropolis, since they were located about 200 m apart. For example, the largest known site of Chamblandes-type graves, the necropolis of Thonon-les-Bains, Genevray, consisting of at least 220 graves, had an extension of around 65 by 45 m (Baudais et al., 2017, 75). In this context, geoelectric investigations were carried out in the area, threatened by gravel mining after the excavation of 1970. The assumption was that the stone slabs would show up in a resistivity diagram. According to the final report, some 4534 m were examined, and, after indications on the resulting resistivity diagram, some small sections were excavated. In all cases, these turned out to be natural terrain features such as depressions in the gravel layer or accumulations of boulders (Fisch, 1970). Therefore, it can be assumed that there were no other stone cists in the area at that time. On April 16, 1970, the newspaper "Solothurner Anzeiger" published an article about the grave discovery at Däniken. This short article with, the title „Ein 5000 Jahre altes Grab",

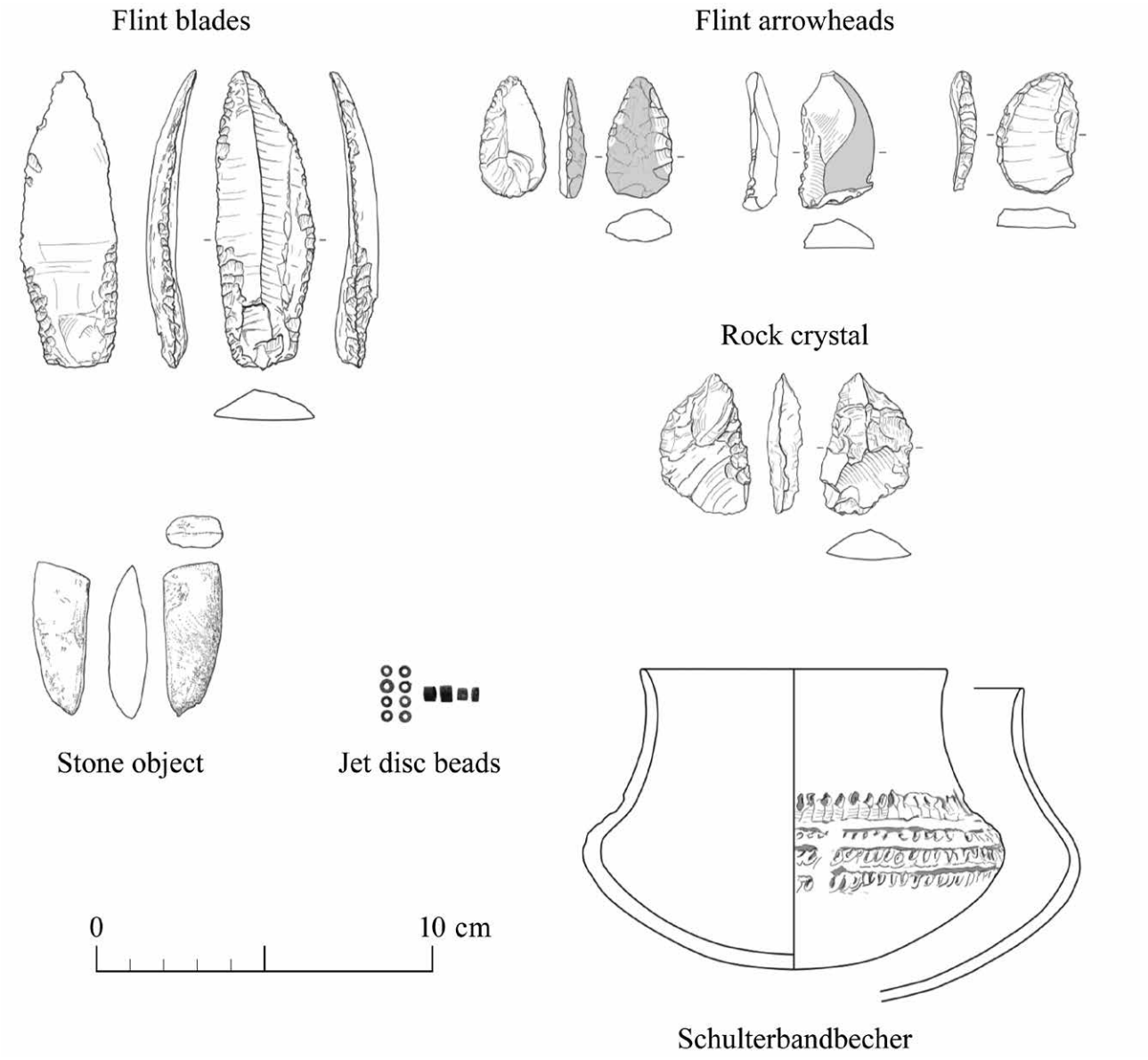


Figure 127: Däniken, Studenweid. Drawing of the grave goods from 1/1970 (source: Steuri and Hafner 2022).

contained an interesting statement by the discoverer of the graves of 1970, the archaeology student E. Balmer. According to him, three other graves were destroyed during gravel mining at another site a week earlier. Unfortunately, no further information is available. Thus, the assumption of an originally larger number of stone cist graves at the site of Däniken can be assumed. Due to large-scale gravel mining, these are probably no longer preserved.

A sandstone slab was discovered in the zone between graves 1/1946 and 2/1946. With a length of up to 145 cm and width of 80 cm, this could have served as a capstone for one of these two stone cists. According to Theodor Schweizer, this sandstone slab was probably originally placed upright and its lower edge was about 25 cm below the lower edge of the stone cists. Therefore, he interpreted it as a stele or standing stone. Poorly preserved bone fragments were discovered at the "foot of the stele", but no further information is available (Schweizer, 1947, 192–193). These human remains may represent a deposit of bones cleared from one of the stone cists.

IV. Individual grave description

The following information on the graves from 1946 originates largely from Schweizer (1974) and, in the case of the ones from 1970, from Dubuis and Osterwalder (1972).

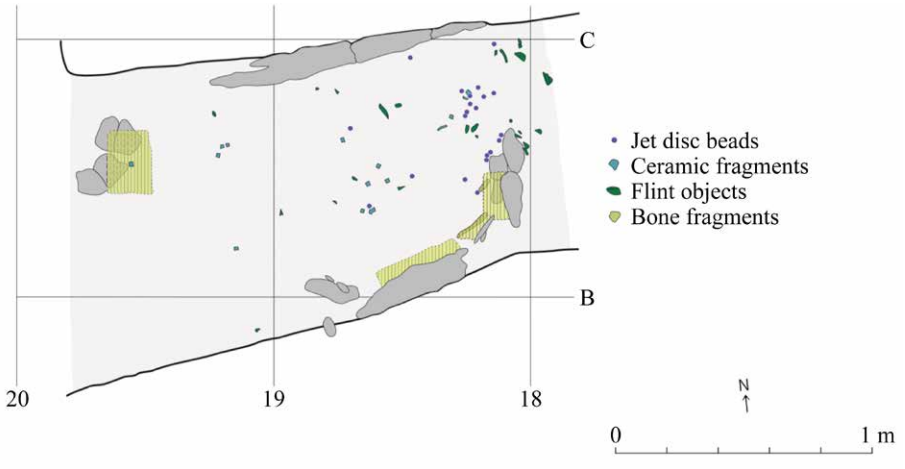


Figure 128: Däniken, Studenweid. Drawing of the grave structure from 2/1970 (source: Steuri and Hafner 2022).

Grave 1/1946

- Grave architecture: A slightly trapezoidal stone cist formed by four lateral stone slabs made of tuff and sandstone. The cist was about 130 cm long and 85 cm wide and oriented in an east-west direction (Fig. 122).
- Human remains: The bones from this grave were recovered as a block and exhibited a very poor state of preservation, as only parts of the skull and the left humerus were preserved. Therefore, neither age nor sex could be determined. The skull bones indicate a subadult individual. The skull lay on the left side, and due to the dimensions of the stone cist, the buried individual was probably placed on the left side of the body with the lower limbs flexed (Bay, 1947, 195–200). Preservation of the skull bones was not possible. In addition, the left upper arm bone was hardened but is now lost.
- Grave goods: Six flint arrowheads with elongated tips and concave bases, one flint blade, two flint chips, a rock crystal fragment, and half of a jet disc bead were found (Fig. 123).

Grave 2/1946

- Grave architecture: A slightly trapezoidal stone cist formed by five lateral stone slabs made of weathered sandstone, with the eastern wall consisting of two overlapping slabs. The cist was about 130 cm long and 80 cm wide and oriented in an east-west direction (Fig. 124).
- Human remains: No human remains were documented within the stone cist.
- Grave goods: Four arrowheads with an elongated tip and concave base, five flint tools, and nine flint chips were recorded. Of the eight pottery fragments, one was decorated by a pierced knob (or small handle). In addition, two small fragments of ochre pigments and 73 complete and 14 fragments of jet disc beads were found (Fig. 125).

Grave 1/1970

- Grave architecture: Only two fragmented, heavily weathered lateral slabs were preserved, indicating a stone cist measuring 110 cm in length and 90 cm in width with an east-west orientation (Fig. 126).
- Human remains: Only fragmented and weathered bones were discovered within this grave, not allowing statements about the individual(s) and burial position.
- Grave goods: Numerous pottery fragments could be reconstructed into a “Schulter-bandbecher”, a decorated beaker. Furthermore, a small stone axe of aphanite, a flint arrowhead with a convex base, a flint blade, two flint scrapers, five flint chips, a rock crystal fragment, and 34 small pottery fragments, as well as 29 complete and 25 fragments of jet disc beads, were found (Fig. 127).

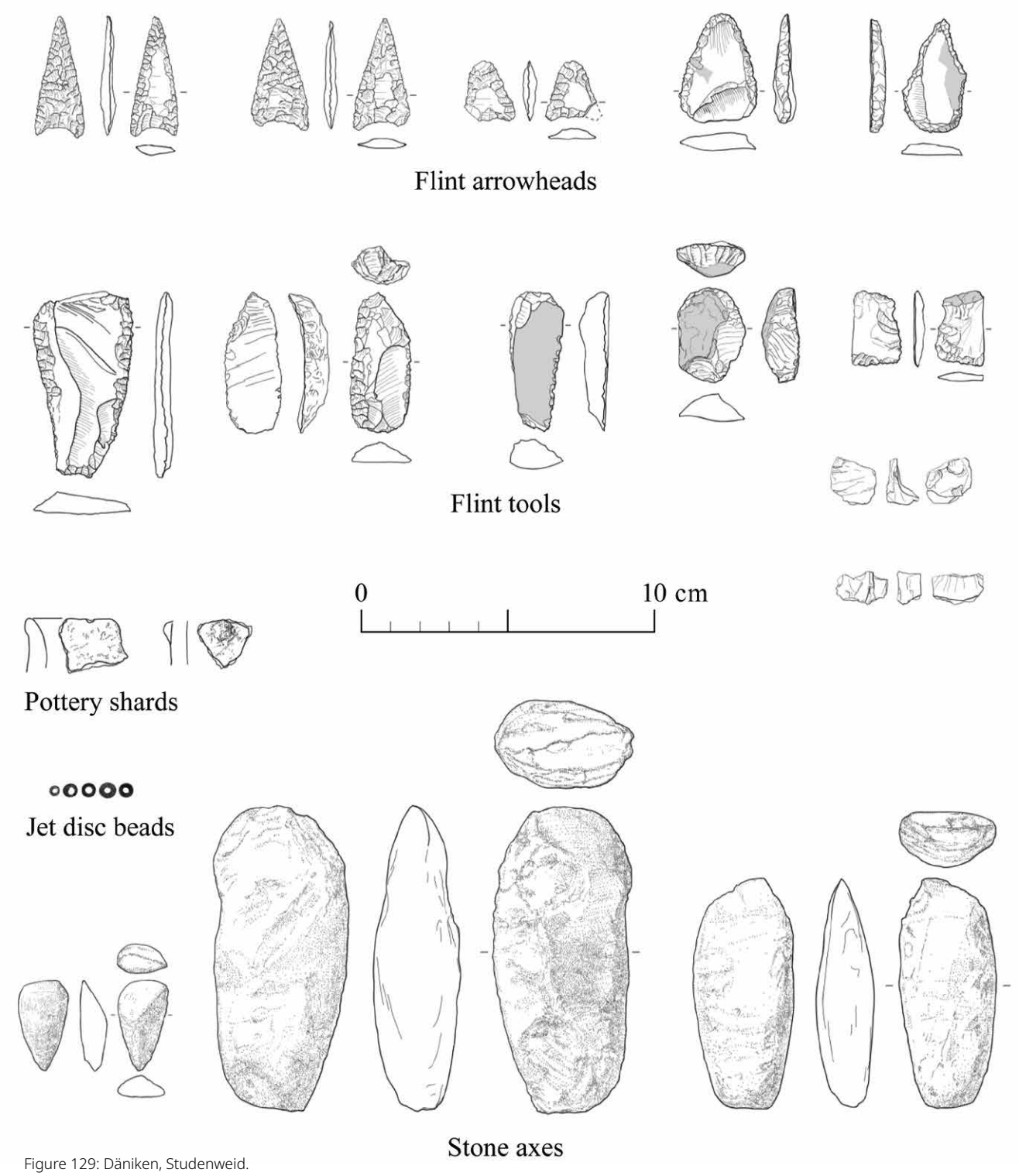


Figure 129: Däniken, Studenweid. Drawing of the grave goods from 2/1970 (source: Steuri and Hafner 2022).

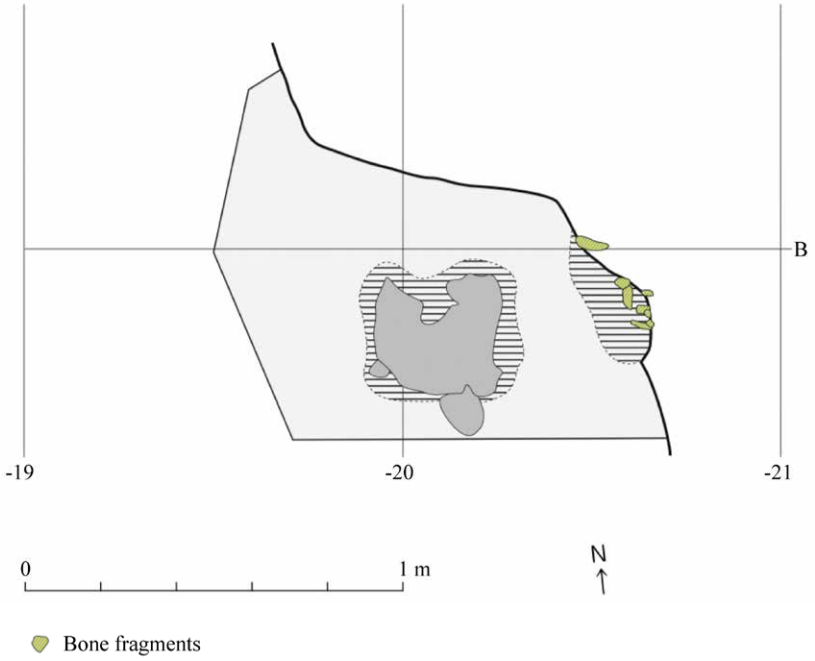


Figure 130: Däniken, Studenweid. Drawing of the grave 3/1970 (source: Steuri and Hafner 2022).

Grave 2/1970

- Grave architecture: Only fragments of weathered tuff could be documented. They indicate a rectangular stone cist with a west-east orientation (Fig. 128).
- Human remains: Only a few bone fragments were found in the southeastern and northwestern parts of the grave.
- Grave goods: Three stone axe blades, the largest made out of limestone and the two others made of nephrite-like stone, were found. Of the five discovered flint arrowheads, three have a concave base with an elongated tip and two have a flat or rounded base. The other flint objects consist of two blades, three scrapers, and 26 chips. Further, two rock crystal fragments and about 30 small pottery fragments, one with a knob and one indicating a notch on the rim, were documented. Finally, some 16 complete and 28 fragments of jet disc beads were found (Fig. 129).

Grave 3/1970

- Grave architecture: An accumulation of bone fragments was found below a tuff slab. This could represent a heavily disturbed stone cist, or a deposition of human remains, possibly removed from the other graves (Fig. 130).
- Human remains: The discovered bones were commingled and relatively well preserved. No data in regards to sex, age, or number of individuals are available.
  Grave goods: Only three small ceramic fragments were documented.

V. Burial practice

Due to the poor state of preservation of the few discovered human remains, the burial practices could not be assessed. The dimension of the graves is an indication that, at least, the presumed primary burials must have been in a crouched position, especially since there was no indication for subadult individuals. The positioning of the lower limbs could not be documented, and secondary burial practices, such as bone deposition, cannot be excluded.

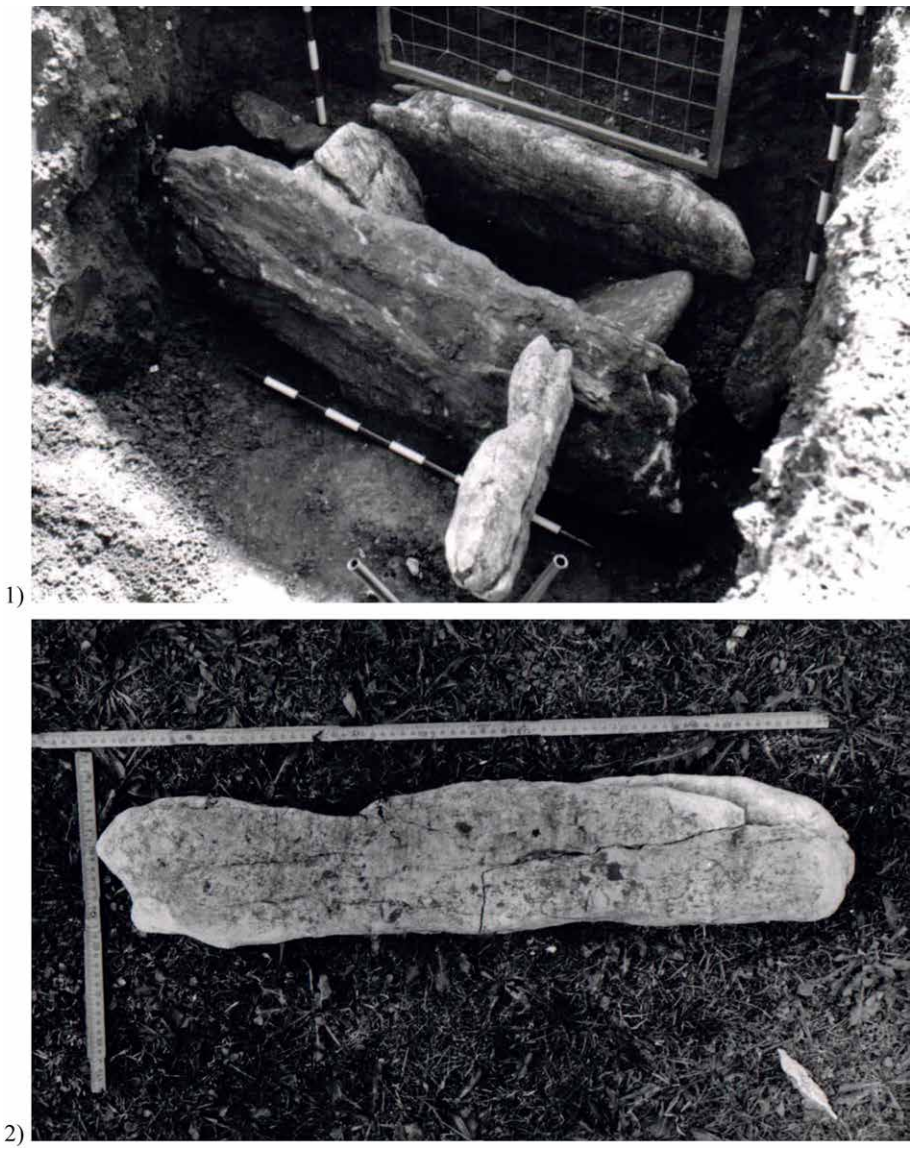


Figure 131: Wettingen, Schartenstrasse. Selected pictures: 1) side view from the north of the grave structure, 2) detailed view of the possible grave marker (source: Kantonsarchäologie Aargau).

VI. Grave goods

A comparatively diverse and large number of grave goods was found within the stone cist graves from Däniken. They consist of the typical arrowheads (graves 1/1964, 2/1946, 1/1970, and 2/1970) and other flint tools, as well as stone axe blades (graves 1/1970 and 2/1970), rock crystal fragments (grave 1/1946, 1/1970, and 2/1970), ochre pigments (grave 2/1970), or jet disc beads (found in every grave except 3/1970).

Regarding pottery objects, the typologically most important object found within the stone cists of Däniken was the "Schulterbandbecher" from grave 1/1970. This fragmented beaker has a rounded form with a flattened bottom and vertical neck. It is decorated with four horizontal rows of punctures and grooves from the belly to the neck. At regular intervals, the lower three rows and grooves are interrupted by four undecorated zones. Apart from this beaker, no other vessel could be reconstructed from the strongly fragmented pottery.

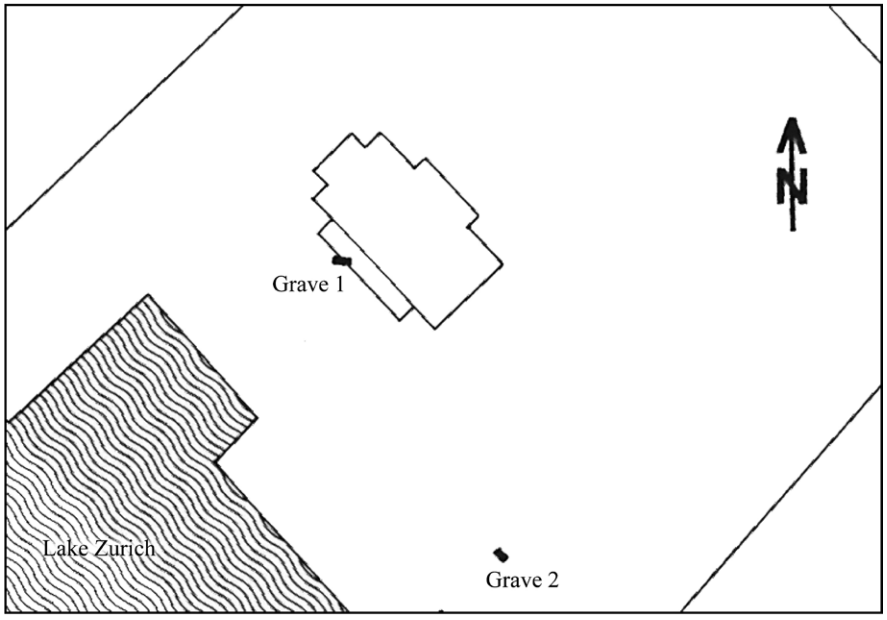


Figure 132: Erlenbach, Geren. Map of the site (source: Modified by N. Steuri after Bill 1981).

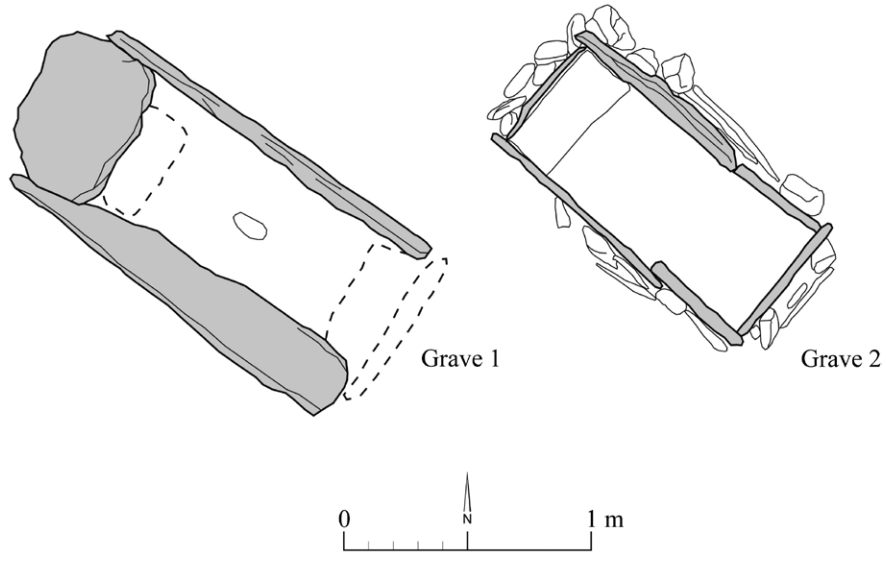


Figure 133: Erlenbach, Geren. Drawings of the graves (source: N. Steuri after Bill 1981).

4.6.3. Outlined sites

Wettingen, Schartenstrasse

Overview: The site is located on Schartenstrasse 77 in the municipality of Wettingen (Aargau, Switzerland), about 750 m east of the Limmat River and about 300 m north of the southern slope of the Lägern ridge. One stone cist grave was discovered during construction work on July 24, 1956. The subsequent excavation lasted from July 26 to August 6, 1956. Apparently, a few years before this discovery, another stone cist grave was destroyed about 22 m to the west (Haberbosch, 1958, 155).

The grave was formed by four lateral stone slabs about 120 cm long and 50 cm wide and is oriented in a southeast-northwest direction (Fig. 131.1). Additionally, a 73-centimetre-long, cylindrical stone found next to the stone cist was interpreted as a possible grave marker (Fig. 131.2). Parts of the skull were found in the southeastern corner of the stone cist. Regarding grave goods, only one jet disc bead was mentioned (Haberbosch, 1958, 155, Taf. 16). The recovered human remains, consisting of a skull and long bone

Figure 134: Erlenbach, Geren. Stone axe from grave 1 (source: Bill 1981).

fragments, indicate an adult individual of at least 28 years of age (Langenegger unpublished letter, 2001).

The grave of Wettingen, about 15 km northeast of the site of Lenzburg or 30 km northwest of Erlenbach, currently marks the northeastern extent of Neolithic stone cist graves of the Chamblandes-type.

Erlenbach, Geren

Overview: The site is located on the street Seestrasse 92 in the municipality of Erlenbach (Zurich, Switzerland), a few metres from the northeastern shore of Lake Zurich. The remains of a stone cist grave (grave 1) were discovered during construction work in 1917. One year later, a second stone cist (grave 2) was found about 40 m southwest of grave 1 (Bill, 1981, 272–275) (Fig. 132).

Grave 1 was a rectangular stone cist, formed by four lateral sandstone slabs. A smaller, flat stone (about 25 cm in diameter) was documented on the grave floor. Since bone fragments were found underneath it, this slab might have been part of the grave cover/capstone. The cist was about 145 cm long and 70 cm wide and oriented in a northwest-southeast direction (Fig. 133). Unfortunately, no information is available in regards to the found human remains. Due to the dimensions of the stone cist, Jakob Bill assumed that the deceased was buried in a crouched position (Bill, 1981, 272). The possibility of a child's burial in a stretched supine position cannot be excluded without anthropological examination. The only grave good of the site consists of one stone axe blade found in the centre of grave 1 (Fig. 134). It was typologically dated to the Neolithic "Pfyn" period by Bill (Bill, 1981, 272). In this context, the lakeshore settlement of Erlenbach-Winkel, located about 450 m south of the stone cist graves, yielded similar stone axes and dendrochronological dating to the Pfyn period (Tobler, 2002).

Grave 2 was a rectangular stone cist, formed by six lateral sandstone slabs, with the long sides each consisting of two slabs. The grave was about 110 cm long and 45 cm wide and oriented in a northwest-southeast direction (Fig. 133). In the northwestern corner of the cist, a flat stone slab (45 by 23 cm) was placed on the grave floor. A few skull fragments and teeth were found on the grave floor. Due to the dimensions of the chamber and placement of the human remains, Jakob Bill concluded that the buried individual was lying on their right side in a crouched position (Bill, 1981, 275).

Apart from these graves in Erlenbach, Neolithic stone cists were also discovered east of Lake Zurich. Sometimes, these are wrongly associated with Chamblandes-type graves. These sites consist of Opfikon, Wallisellenstrasse (Zurich, Switzerland), and Rapperswil, Kempraten (St. Gallen, Switzerland):

- At Opfikon (about 20 km north of Erlenbach), a large stone cist was discovered in 1931 (about 180 cm long and 145 cm wide). It contained two individuals in a stretched supine position with several flint objects and a small stone axe blade. Typologically, the grave was dated to the 3rd millennium BCE Corded Ware period. In the 1990s,

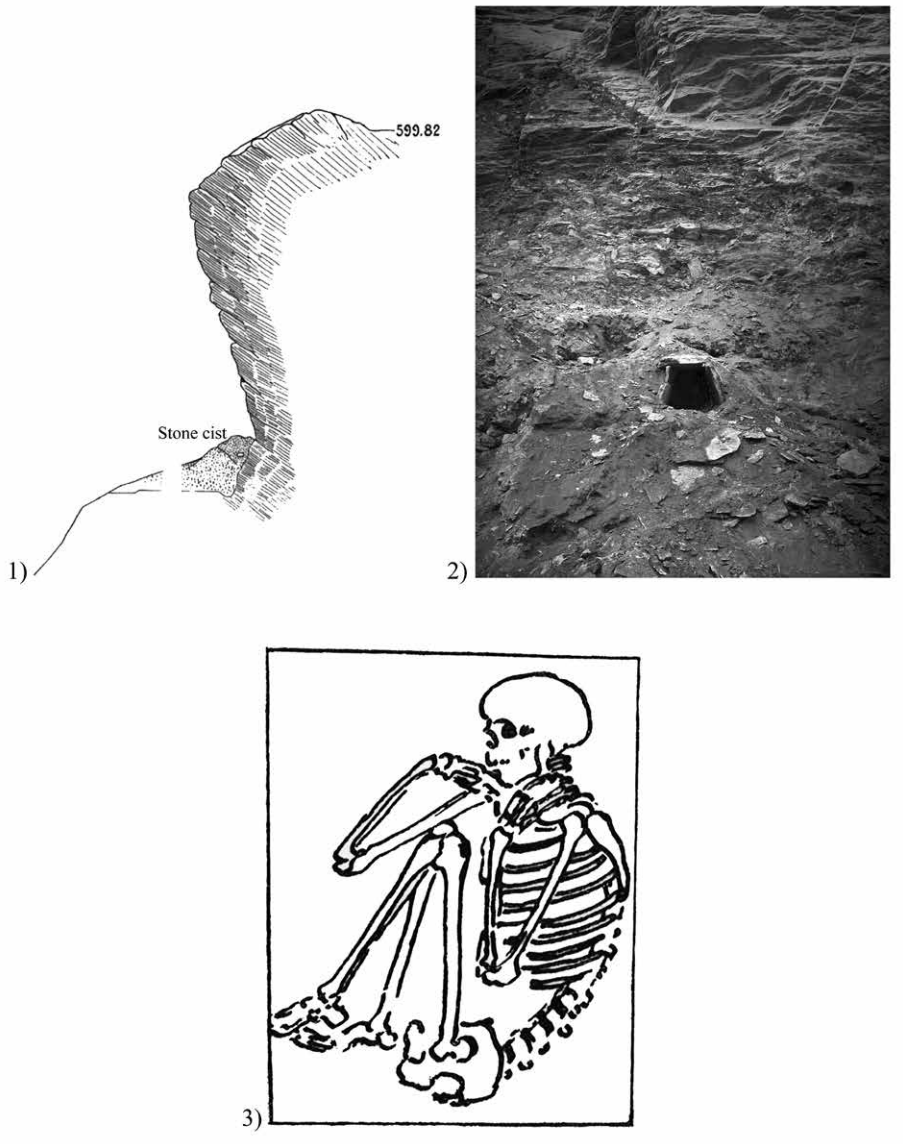


Figure 135: Niederried, Ursisbalm. Selected drawings and pictures: 1) drawing of the cross-section of the site, 2) top view of the grave, 3) drawing of the human remains within the grave (source: Steuri et al. 2023).

two further stone cist graves were discovered with individuals in a supine position and without grave goods (Graf, 1998, 1995).

- The stone cist of Rapperswil (20 km southeast of Erlenbach) was discovered in 1980 and was 216 cm long and 47 cm wide. Inside were the remains of a pregnant female individual stretched in a supine position. The grave goods consisted of numerous pendants: three bear and two dog teeth and four marine shells (Grüninger and Kaufmann, 1982, 72–75). One bone sample dates the female between 2851 and 2481 cal. BCE (Siebke, 2019).

4.7. Peripheral sites

Regarding the sites located outside the defined geographical zones, the focus was on the stone cist of Niederried, Ursisbalm (Chapter 4.7.1), as well as the grave groups of Chiomonte, La Maddalena (Chapter 4.7.2) and Montagnieu, Grotte-du-Souhait (Chapter 4.7.3) (for the location of sites, see Fig. 1).

4.7.1. Niederried, Ursisbalm

I. Context

The site consisting of (at least) one stone cist is located west of the village of Niederried, near the "Ursisbalm" meadow. It is situated at an altitude of 583 m at the foot of a rocky spur, some 15 m above the northern shore of Lake Brienz (Fig. 135.1).

This grave currently represents the only known site of Neolithic stone cist graves in the northern Prealps. Therefore, it is especially important not to confuse the location of Niederried, Ursisbalm (near Interlaken) with Niederried near Kallnach (Bern, Switzerland), which lies about 90 km to the northwest (as in Jungnickel, 2019).

II. Background

During work on the railroad of the Brienzerseebahn, a "stone box" with human bones piled up in a "strange way" was discovered on September 11, 1913 (Tschumi, 1915, 192). The construction work was temporarily suspended, and the site was visited by Otto Tschumi of the Historical Museum of Bern (Bernisches Historisches Museum). Between September 16 and 20, he collected the human remains and took photographs of the stone cist.

III. Spatial organisation of the necropolis

According to a foreman, at least four additional stone cists were discovered about 200 m south of the site. However, these were recognised "too late" and destroyed without any investigation or documentation (Tschumi, 1914, 81). If this statement is correct, it is likely that the site of Niederried was not just an isolated grave, but rather a group of stone cists or a small necropolis on the shore of Lake Brienz.

IV. Individual grave description

- Grave architecture: A rectangular stone cist formed by three lateral limestone slabs (at the time of discovery, a southeastern lateral slab was missing). The capstone was trapezoidal and slightly overhung the lateral slabs. The cist was about 100 cm long and 50 cm wide and oriented in a northwest-southeast direction (Fig. 135.2).
- Human remains: The grave contained the primary burial of an adult female placed on the right side of the body with the skull in the northwestern corner of the chamber and facing southwest. The arms were crossed over the chest and the legs hyperflexed (with the knees at chest level). On the northeastern side outside the stone cist, the commingled bones of at least two other subadult individuals were discovered. Some years later, these human remains were re-examined and two bone fragments of a second adult individual were found (Schlaginhaufen, 1925, 2–3).
- Grave goods: No finds were recorded.

V. Burial practice

Based on the documented orientation, the individual was buried on the right side of the body (Fig. 135.3). Although the placement on the left side or the back is more common, there are isolated examples of this burial position; for example, grave T143 at the site of Thonon-les-Bains, Genevray (Baudais et al., 2017, 676–680), or grave T8 at Sion, Sous-le-Scex (Honegger, 2011, 122). The human remains found next to the grave can be interpreted as cleared and deposited bones of older burials.

Additionally, a "mighty stone slab" next to the stone cist showed traces of charcoal and was interpreted as a possible hearth (Tschumi, 1920, 221). It is also possible that it was related to performed rituals, though no further information is available.

VI. Grave goods

No grave goods were recorded.

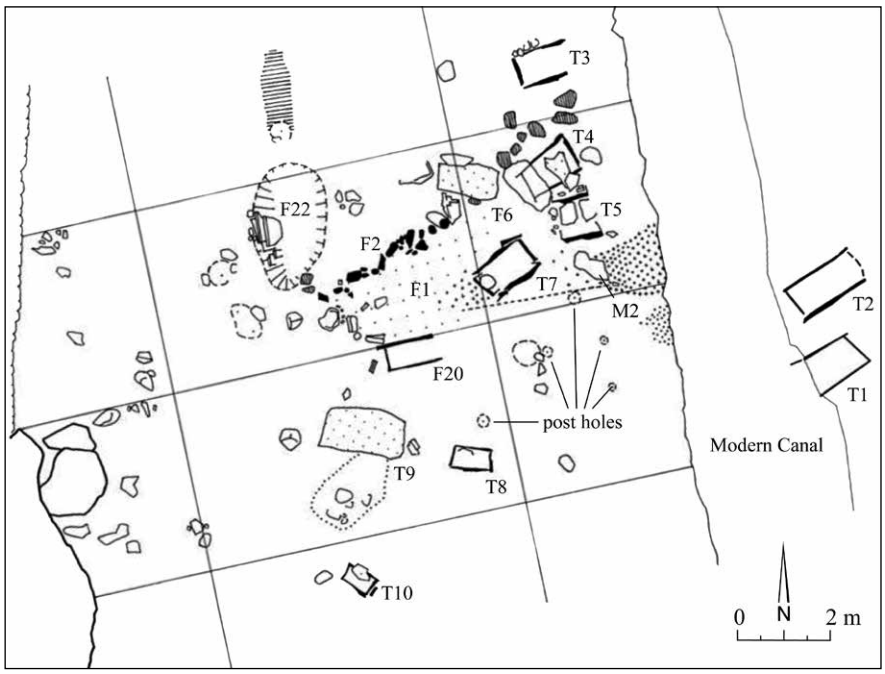


Figure 136: Chiomonte, La Maddalena. Map of the site (source: Modified by N. Steuri after © Fedele 2002).

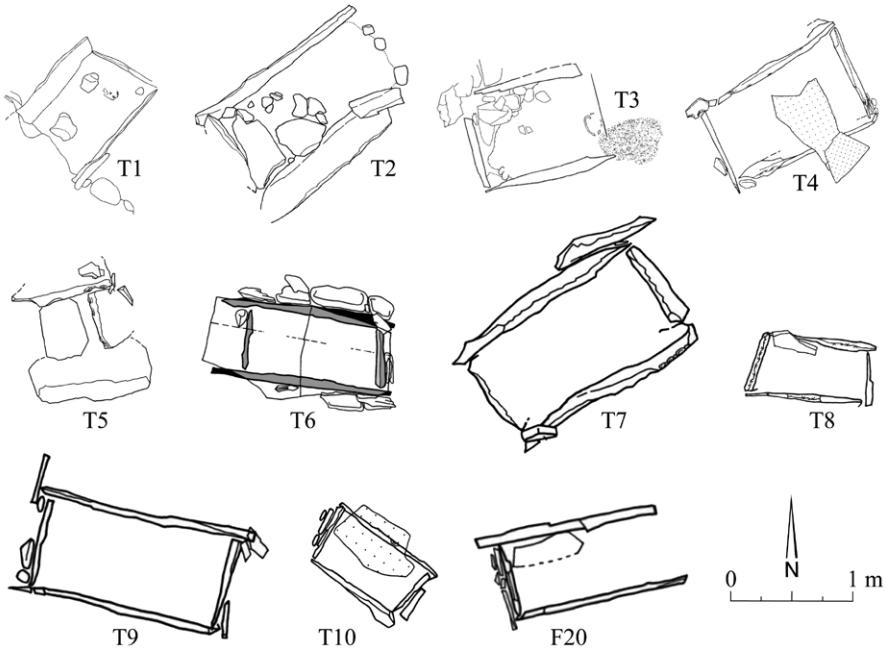


Figure 137: Chiomonte, La Maddalena. Drawings of the graves (source: Modified by N. Steuri after © Fedele 2002).

4.7.2. Chiomonte, La Maddalena

I. Context

The site consisting of at least ten stone cists is located in the municipality of Chiomonte (Piedmont, Italy) in the upper Susa Valley. It is situated at an altitude of 730 m on a natural terrace called "La Maddalena".

The Susa Valley is located between the Grajan Alps and the Cottian Alps. It is about 70 km long, connecting the Italian Po Valley and the French Rhône Valley.

II. Background

During road construction in 1984, Neolithic settlement layers were found on the left side of the valley and subsequently investigated in several short excavation campaigns. In November 1986, about 50 m southeast of this settlement site, two stone cists (T1 and 2) were discovered. Disturbed by a modern utility trench, a second group of graves came to light about 4 m to the west in January 1987. Subsequently, an area of about 210 m^2 (16 by 13 m) was excavated from May 30 to July 3, 1987, revealing a total of at least ten stone cist graves and numerous other features related to ritual activities (Fedele, 2002, 111–114) (Fig. 136).

The contents of the Neolithic graves (T1–10) and the stone cist F20 were recovered as a block for later analysis in the laboratory. This research was started in October 2003, but at the time of the most recent published article, the results were still not fully available (Fedele, 2007, 317).

Based on the features of the stone cists and structures between the graves, it was suggested that the end of use of the site was probably related to a landslide of the nearby hillside. Debris coming from the north covered most of the necropolis and displaced some of the lateral stone slabs of the stone cists (Fedele, 2007, 313).

Neolithic settlement layer(s): As postholes could hardly be detected in the stony sediment, nearby houses were identified mainly on the placement of hearths. The discovered pottery fragments are mainly from "Knickwandschüssel" bowls (ca. 35%). Vessel forms and ornamental elements show connections to the Chasséen ceramic type (such as bowls with incised decorations on the rim) and the Cortaillod-Saint-Léonard ceramic type (fluted applications). Among the recovered material were also at least 2000 animal bones. An examination of 600 fragments led to the conclusion that they were mainly remains of wild game (deer and fox), and livestock therefore probably played a minor role in their diet (Bertone and Fedele, 1991, 75–78).

III. Spatial organisation of the necropolis

The stone cists were constructed in pits and originally formed by four lateral stone slabs (Fig. 137). In some cases, up to 10 cm deep grooves for the placement of the slabs could be found on the bottom of the pits. A capstone was placed on top of the stone cists and the stratigraphy of the site indicates that only this stone was visible on the Neolithic surface. To compensate for the uneven grave floor, a layer of fine sand of up to 10 cm in thickness was placed inside the stone cists T3, T4, and T6. Additionally, smaller stone slabs were placed on the bottom of grave T9. All used slabs are of local alpine slate that was probably worked directly on site, based on the evidence from pit 22 (covered below) and numerous slate fragments in the backfill of the burial pits (Fedele, 2007, 313).

Regarding the organisation of the necropolis, the five graves T3 to T7 appeared to have been grouped relatively close together. In addition, larger stone slabs found next to graves T6, T8, T9, and T10 were suspected to represent potential grave markings. Additional pits found on the site were interpreted as potential burial pits for unfinished stone cists (Fedele, 2007, 313).

Other structures and features (see Fig. 136):

- Three lateral stone slabs formed the rectangular structure F20, with a length of about 170 cm and a width of 85 cm. No slab could be detected on the eastern flank. The northern lateral stone was about 12 cm higher than the other lateral slabs and the largest structural stone in the entire necropolis, measuring 160 cm long, 70 cm high, and 15 cm thick. A larger fragment of what might have been the original capstone was found in front of this northern lateral stone slab. This box-like structure was constructed in a much deeper pit than the other stone cist graves. In addition, the stratigraphy suggested that structure F20 was contemporaneous with the open, "ceremonial" area F1 and is therefore probably

older than the stone cist graves. Inside the structure F20, a 15–20 cm thick layer of various stone fragments and human remains was found. The stones were addressed as fragments of the capstone, and their intermixing with the bones led to the hypothesis that these human remains may have originally been placed on the capstone at the time of the collapse. The backfill above this layer contained charcoal fragments, calcined bones, and a few pottery sherds. The anthropological evaluation of the commingled bone fragments from this structure was still pending, but according to Francesco Fedele, they could be from several individuals. This led to the interpretation that the structure F20 could have been an ossuary (possibly for cleared-out human remains) or a disturbed stone cist grave with slightly modified architecture (hence the alternative designation of "T11"; Fedele, 2002, 146–148).

- A small open zone named structure F1 between graves T6, T7, and F20 was described as a "ceremonial" area. In the northwest, F1 was delimited by a series of different stone blocks. These placed stones formed structure F2 and were up to 72 cm long. Stratigraphically, this row of stones must have already existed at the time of the construction of grave T6, since its burial pit disturbed one of the stone blocks. It can be assumed that the stone row extended eastwards beyond grave T6, since the three stone blocks of structure F3 have the same orientation and shape (Fedele, 2002, 115).
- In the area, between graves T5 and T7, a large stone with the designation M2 was found. This flat stone is about 90 cm long and 50 cm high. The stratigraphy indicated that M2 was placed there during the time of use of the necropolis. On the eastern flank of this stone, a large number of charcoal fragments and calcined deer antler fragments were found (Fedele, 2002, 115–116).
- South of the stone M2, five to six postholes were discovered, and one was contemporaneous with grave T8. The position of at least three postholes indicates a construction approximately 2 m south of T5 and T7. It was assumed that this could have been related to the burial ritual, for example, that the deceased were placed on a wooden platform (Fedele, 2002, 117–118).
- A few metres northwest of T6, F20, and the stone row F2, the large pit F22 was discovered. On the western wall of the pit, several worked, stacked slabs were found. They were of the same slate that was used for the construction of the stone cists. This led Fedele to suspect that this pit could represent a deposit of building material for the graves. The slabs may have been placed in the pit to keep them still and upright for processing (Fedele, 2002, 118–119).

IV. Individual grave description

An account of the individual graves is omitted here, as these data are listed in the publications by Fedele (Fedele, 2007, 2002) and the relevant information for this study is listed in the subsequent sections.

V. Burial practice

The state of preservation of the bones was described as very poor due to the acidity of the soil. As mentioned, the grave contents of the stone cists were recovered as a block and have not yet been fully evaluated; therefore, only limited information regarding the age and sex of the buried individuals is possible (Fedele, 2007, 319).

- The four graves T2, T4, T8, and T9 can be described as primary burials of single individuals, however, only a few bones were preserved. In the case of T4, it cannot be ruled out yet that the recovered human remains originate from two individuals.
- A majority of the stone cists only contained skull fragments; in T3 and T7, one skull without the mandible was found, while graves T1, T6, and T10 contained fragments of mandibles.

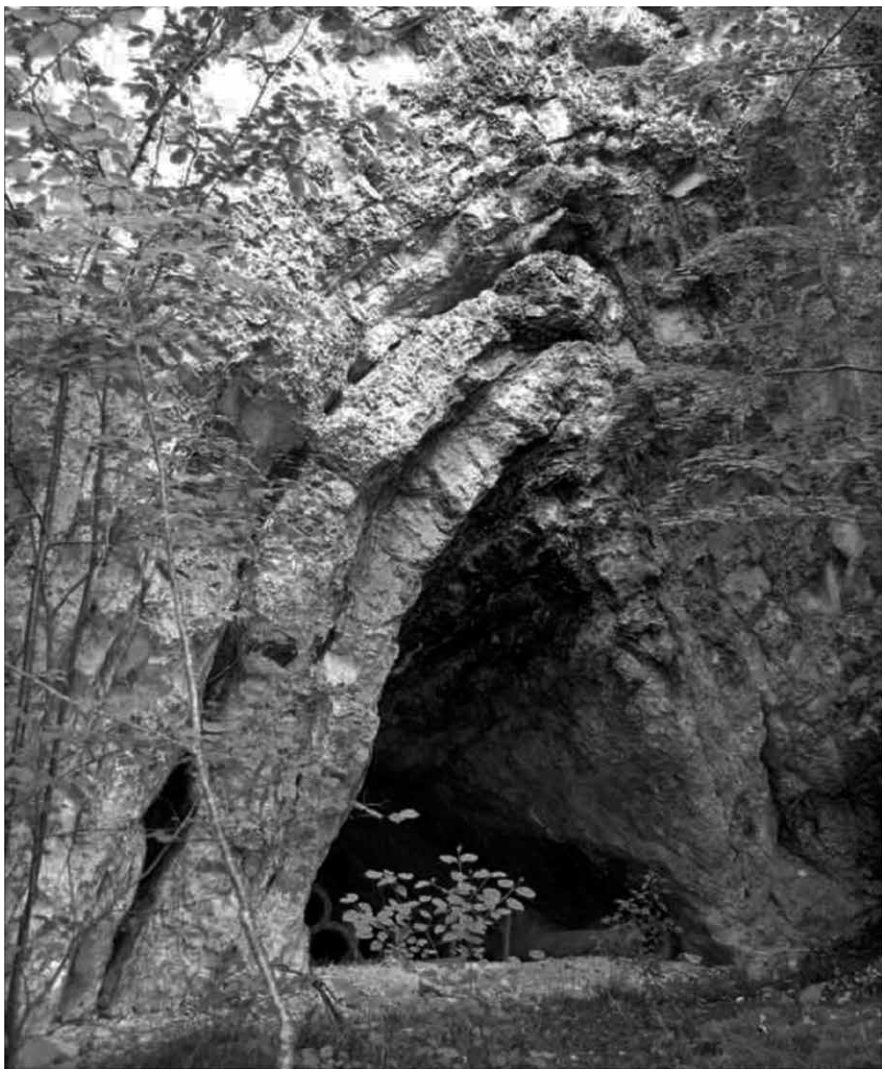


Figure 138: Montagnieu, Grotte-du-Souhait. Picture of the cave entrance (source: © Gatto 2012).

- No human remains were found within T5. Due to the small dimensions of this stone cist, it cannot be excluded that it was designed for a juvenile and its more delicate bones were not preserved in the acidic soil.

The available human remains indicate that the primary burials were placed on the left side of the body in a crouched position (with the knees probably above the pelvis level). The head was located between the northeast to southeast, facing south. The graves with isolated skull fragments indicate secondary burial elements of bone depositions.

VI. Grave goods

Only a few objects were found within the stone cists, consisting of flint chips in graves T4 and T9, a small greenstone object in T7, and the jaw of a goat in T4.

4.7.3. Montagnieu, Grotte-du-Souhait

I. Context

The site, consisting of at least five stone cists and three pit graves, is located in front of the cave "Grotte de Souhait" northeast of the villages of Montagnieu and Briord (Ain, France) (Fig. 138). It is situated at an altitude of 510 m, in the valley of the river Arodin, itself a

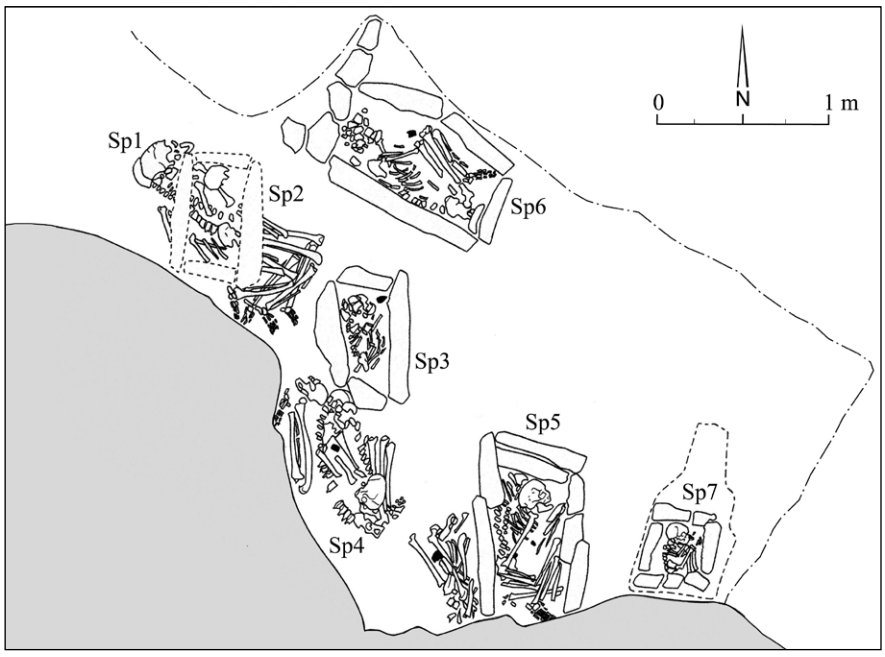


Figure 139: Montagnieu, Grotte-du-Souhait. Map of the site (source: Modified by N. Steuri after Gatto 2012).

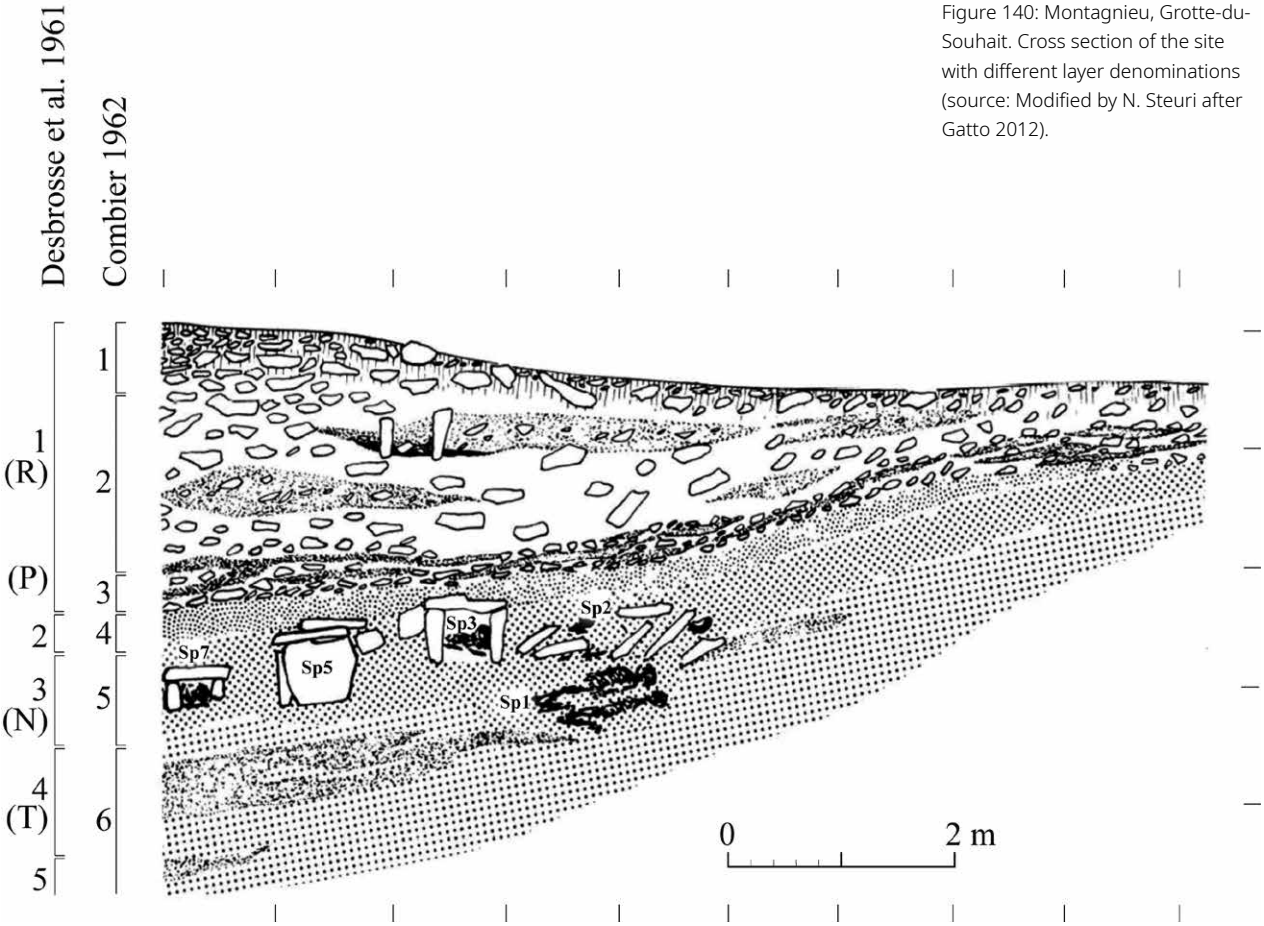


Figure 140: Montagnieu, Grotte-du-Souhait. Cross section of the site with different layer denominations (source: Modified by N. Steuri after Gatto 2012).

tributary of the Rhône, running a few kilometres to the west. Additionally, Montagnieu is about 100 km west of the necropolises of the Lake Geneva region or the Aosta Valley.

II. Background

The archaeological layers inside the cave Grotte de Souhait were first studied in 1955. On the right side, in front of the cave entrance, the single burial "Sg" (also called "tombe de la grotte") was discovered. During the excavation campaign of 1959–61, an area of about 15 m^2 was investigated on the left side in front of the cave entrance, along the rock face, and seven additional Neolithic graves were discovered (named Sp1 to Sp7) (Fig. 139).

A profile section in the outer area of the cave was able to clarify the four-metre-high stratigraphic sequence of the site. Since different designations/numberings were used in the different publications, the stratigraphy will be clarified and listed in the following section (Fig. 140).

- In Desbrosse et al. (1961), the humus and limestone layers down to a depth of 1.05 m are described with a numbering from 1 to 6. The (original) Layer 3 was addressed as "Gallo-Roman" on the basis of the finds and designated with the letter "R". Similarly, Layer 5, with objects interpreted to be from the Bronze Age, was addressed as "protohistoric" with the letter "P". Due to the irregular stratigraphy, all horizons from the modern surface level to the lower edge of "P" were summarised under the term Layer 1 (Desbrosse et al., 1961, 4–5).
- Below these layers, a level of "sterile" greyish gravel was found (Layer 2).
- The Neolithic graves followed within Layer 3, which is why this layer was also addressed by the letter "N". Additionally, the sediment contained larger gravel, charcoal fragments, and objects such as flint tools, pottery fragments and animal bones.
- The separation between Layer 3 and the underlying Layer 4 was indistinct in places. It consisted of greyish gravel with numerous charcoal fragments, as well as flint and animal bones. Three zones with hearths were described, and Layer 4 was cut by the burial pit of graves Sp1/Sp2. This layer was assigned to the Late Mesolithic Tardenoisien and consequently labelled "T".
- Finally, the in situ soil, consisting of yellowish gravel, was summarised under Layer 5 (Desbrosse et al., 1961, 5–10).

In the publication by Jean Combier, the layers summarised by Desbrosse et al. (1961) as "Layer 1" were subdivided, with Layer 1 referring here only to the modern humus and the Gallo-Roman level following as Layer 2. Layer "P", with the Bronze Age material, was labelled Layer 3. After the gravel layer (4) followed Layer 5, with Neolithic graves. Under Layer 6, Combier summarised the levels with Late Mesolithic finds ("T") and in situ (Combier, 1962, 252–256).

The human remains of the graves (Sp1, 4, 5, and 6) were subjected to a new analysis by Esther Gatto in 2006 (Gatto, 2012). The recovery of the bones was not anthropologically documented during the excavation; therefore, Gatto had to rely mainly on the published data and photographs. An inventory at the "Service régional de l'archéologie de Lyon" revealed that most skeletons were incomplete. Finally, the remains of three subadult individuals could be located in the museum of Briord, probably representing the single burials in stone cists Sp2, 3, and 7.

III. Spatial organisation of the necropolis

Statements about the organisation of the graves within this site are difficult. They consist of stone cists and simple pit burials (described as "en pleine terre"), grouped together along the rock face on both sides of a cave opening.

IV. Individual grave description

Since the data on the individual graves were only published in an out-of-print regional journal (Desbrosse et al., 1961), the relevant information for this study is listed here.

Grave Sg

- Grave architecture: A large stone block near the skull of the buried individual was mentioned. Due to the lack of features that would indicate a stone or wooden cist, a burial in a simple pit was assumed for this grave.
- Human remains: The bones of an adult individual (labelled Sg-I) were found in a poor state of preservation. The placement was on the left side of the body, with the lower limbs hyperflexed (the knees at the level of the chin) and the arms folded on the chest. The skeleton was facing the cave entrance and thus probably oriented southeast.
- Grave goods: A small stone axe blade of polished greenstone and some pottery fragments were found.

Grave Sp1

- Grave architecture: No indications of specific grave architecture were recorded. Therefore, the grave was labelled as a pit grave "en pleine terre"; however, a casing of wooden planks is also possible. The rectangular pit was placed along the rock face with a northwest-southeast orientation.
- Human remains: This grave contained the remains of two adult individuals (1-I and 1-II). They were placed on the left side of their bodies with flexed legs (feet below the pelvis and knees at pelvic level). The skulls lay in the northwest and the arms were extended along the body (Desbrosse et al., 1961, 13). Individual 1-II was placed directly above individual 1-I, and a narrow sediment layer was noted between these skeletons during excavation. Therefore, it was suspected that they might be two successive burials. Maybe individual 1-I was placed in the pit, covered with sediment and subsequently followed by individual 1-II. It is also possible that the individuals were buried simultaneously, but the bodies were wrapped in organic material. According to Desbrosse et al., individual 1-I is a 50- to 60-year-old female and individual 1-II is a male between 40 and 50 years of age. Similarly, the new investigation of Gatto indicates an adult male and a female of similar age (Gatto, 2012, 62).
- Grave goods: No finds were recorded.

Grave Sp2

- Grave architecture: This grave was located directly above Sp1 and was heavily disturbed. Displaced stone slabs and foundation trenches indicate that it was originally a rectangular stone cist.
- Human remains: Only the commingled bones of one individual (2-I) were present. Based on the assumed grave size, the individual was probably an infant.
- Grave goods: No finds were recorded.

Grave Sp3

- Grave architecture: A rectangular stone cist formed by four lateral stone slabs and a capstone. The cist was about 65 cm long and 28 cm wide and oriented in a north-south direction.
- Human remains: The grave contained the primary burial of a 3- to 4-year-old individual (Desbrosse et al., 1961, 15). The skeleton (3-I) was lying on the left side of the body in a crouched position and the skull was placed to the north, facing east.
- Grave goods: A small stone axe blade of polished greenstone and an oval fragment of Triton shell with two perforations were found.

Grave Sp4

- Grave architecture: No indications of specific grave architecture were recorded and the grave was therefore labelled as a pit grave "en pleine terre". However, Gatto suggested that the strong contraction of the lower limbs of the buried individuals may have been due to the physical restriction of a wooden casing (Gatto, 2012, 63). But as with Sp1, no conclusions can be made regarding the grave architecture. The pit was placed along the rock face and in a northwest-southeast orientation.
- Human remains: The remains of two primary burials were found within the pit, consisting of a juvenile-to-adult male (4-II) laying directly over a juvenile individual (4-I). Both individuals were placed on the left side of their body, with the arms on the chest and legs hyperflexed (with the knees at the level of the face and the heels touching the pelvis). The skull of the lower individual (4-I) was oriented north, facing east, while the individual above had its skull in the south, facing west. Gatto expressed reservations regarding this "opposite" placement of this individual 4-II, as the skeleton showed some displacements (Gatto, 2012, 66). During the inventory of the human remains labelled to be from this grave, Gatto was able to detect at least six individuals. These were two adult and four subadult individuals, with two skeletons labelled "sq4" and "sq5". Upon completion of the inventory of all bones from this site, the remains of individuals 4 and 5 of grave Sp5 were missing. Thus, it can be assumed that sq4 and sq5 (and probably other bones) were originally found in grave Sp5, not Sp4 (Gatto, 2012, 63).
- Grave goods: Some pottery fragments could be reconstructed and identified as the lower part of a small vessel with a knob.

Grave Sp5

- Grave architecture: Seven partly overlapping lateral stone slabs were placed along the rock face, forming a rectangular stone cist. It was about 84 cm long and 38 cm wide and oriented in a north-south direction.
- Human remains: The bones of at least eight individuals were found within this grave. Three primary burials were placed one above the other, consisting of a 4- to 7-year-old child (5-I), a 15- to 19-year-old juvenile (5-II), and a 20- to 39-year-old adult individual (5-III; Gatto, 2012, 63). Individual 5-II was placed on the left side of their body, with the head towards the north and the lower limbs slightly flexed (knees at the level of the pelvis and the feet under the pelvis). In contrast, the lower limbs of individual 5-III were hyperflexed (with the knees at chest level). Due to these later burials (5-II and 5-III), the skeleton of the lowest individual 5-I was disturbed and the bones were displaced. Above these three primary burials, the commingled human remains of at least five other individuals (5-IV to 5-VIII) were found. According to Gatto, these were from two adults and three minors (Gatto, 2012, 63). It was not possible to determine whether these bones represent the secondary deposition of human remains or disturbed primary burials. Interestingly, along the outside of the western side of the stone cist Sp5, an accumulation of commingled human remains was found, consisting mainly of long bones, vertebrae, and skull fragments. During an osteological evaluation, Gatto was able to establish that the remains of this "ossuary" probably partially originated from the same skeletons recovered within Sp5. She reports several matches; for example, a left calcaneus of the ossuary belonging to individual 5-II was inside the stone cist (Gatto, 2012, 63).
- Grave goods: An animal bone tool (awl) and a perforated pebble bead were found inside the cist. Additionally, the bottom of a pottery vessel was recovered among the human remains on the outside.

Grave Sp6

- Grave architecture: Several different stone slabs formed a rectangular stone cist about 100 cm long and 48 cm wide. The stone cist was oriented northwest-southeast (such as Sp1), about 1 m from the rock face.

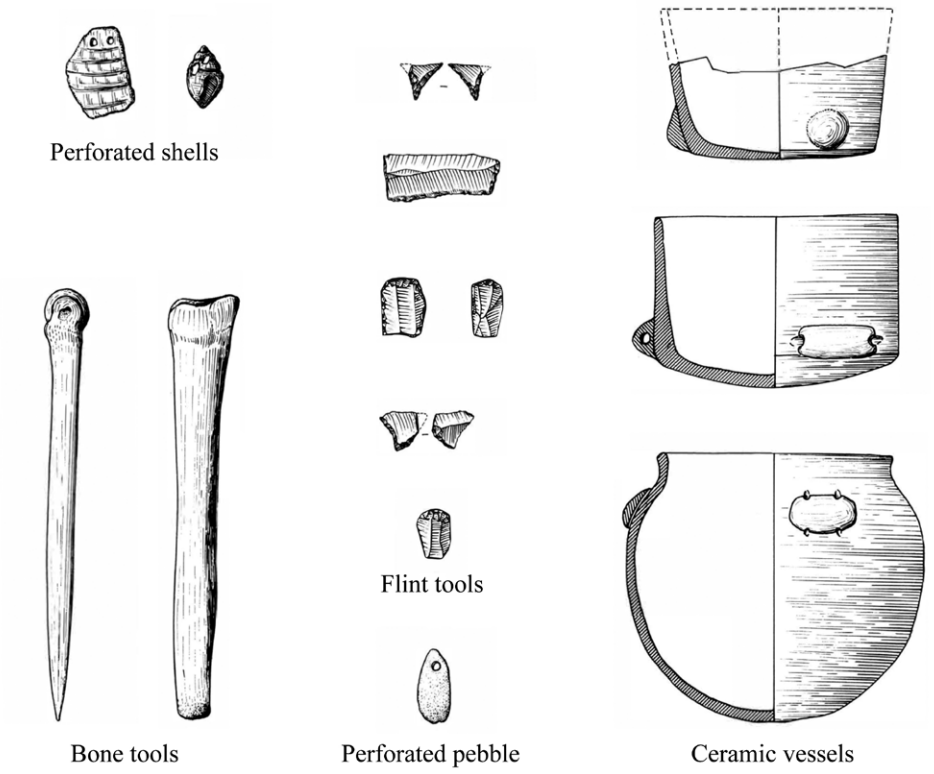


Figure 141: Montagnieu, Grotte-du-Souhait. Grave goods from various graves, unknown scale (source: © Gatto 2012).

- Human remains: The grave contained the remains of three adult individuals (6-I, 6-II, and 6-III). On the basis of the few bones present, Gatto was unable to make a reliable sex or age determination (Gatto, 2012, 64). The individuals were placed on the left side of the body with the lower limbs flexed and the heads in the northwest.
- Grave goods: A fragmented pottery vessel and a probable flint arrowhead were found.

Grave Sp7

- Grave architecture: A small square stone cist was formed by seven lateral stones and a large capstone. While the cist was only 30 cm long and 26 cm wide, the capstone was up to 96 cm long and 54 cm wide. Similar to the stone cists Sp3 and Sp5, this grave was oriented in a north-south direction.
- Human remains: Within this small grave, the remains of a 4- to 5-year-old child (7-I) were found. It was placed in a fetal position on the left side of the body, with legs flexed and facing east.
- Grave goods: At least three flint blades and flint splinters were recovered.

V. Burial practice

As Gatto noted, the eight graves of this site seem to follow two orientations: Sp1, 4, 6 (and probably Sg) have a northwest-southeast orientation, while Sp2, 3, 5, and 7 have a more north-south orientation (Gatto, 2012, 64). Since grave Sp2 was placed directly above Sp1, it has been suggested that these orientations may reflect different usage phases. Due to the poor preservation of the cranial and pelvic bones, Gatto was not able to determine the sex of the adult individuals. Concerning the distribution of age classes, only adult individuals were found within the largest stone cist Sp6, while the three smaller graves Sp2, 3, and 7 contained single burials of subadults. Relevant in this context, the two pit graves (Sp1 and 4) each contained two adult individuals.

A total of 19 individuals were found within the eight graves of the site in Montagnieu. At least 12 can be addressed as primary burials. Additionally, the 2-I and 5-I individuals probably represent disturbed primary burials, while the commingled human remains

from five individuals (5-IV to 5-VIII) of Sp5 indicate the secondary placement of bones. In addition, Gatto was able to establish some connections between the commingled human remains placed inside and outside this stone cist. This led to the interpretation that certain skeletal elements were deposited at different places of the grave site.

Given the orientation of the graves, the buried individuals were also oriented either with the head north or northwest. The reversed placement of individual 4-II with the skull towards the southeast is striking, and a similar practice was observed within Tombe 5 at the site of Aime (Gély et al., 1991, 44).

With the exception of the different orientations, all primary burials show a relatively consistent placement on the left side of the body with the lower limbs flexed. For the individual within Sp1, only the lower legs were bent (with the knees below the pelvis), while the legs were strongly tucked up and knees at about the level of the chin for individuals Sg-I, 4-I, and 4-II. The arms were probably mostly folded over the chest; only in the case of the two individuals of Sp1 do the arms seem to have been stretched along the body.

VI. Grave goods

The few grave goods consist of two ornamental objects (a perforated seashell and a stone bead), some stone and flint tools (axes, arrowheads, blades), and pottery fragments of at least three reconstructed vessels (two bowls and one pot) (Fig. 141).

PART II

RESULTS AND DISCUSSION

Radiocarbon dates of Western Alpine cist graves

5

The following subchapters focus on the evaluated sites from Chapter 4, subdivided into the defined geographical zones. First, the radiocarbon data available previous to this study will be listed (Chapter 5.1), as these results influenced the covered subsequent sampling strategy for additional radiocarbon dates (Chapter 5.2). Second, the specific sample treatment is covered (Chapter 5.3), followed by a listing of the results (Chapter 5.4).

5.1. Available radiocarbon data

Before the start of this research project, a comparatively low number of modern radiocarbon dates were available to analyse the stated chronological research questions (see Fig. 6). This holds especially true when dates with high uncertainty ranges are excluded. Dated bone samples with uncertainties over ± 65 years were not considered, as their calibrated age ranges spread over centuries, making them unusable for this study. Here follows a record of the considered radiocarbon dates (details are listed in Table 1).

Aosta Valley

No radiocarbon data of human remains of the Neolithic cist grave sites in the Aosta Valley were available.

Tarentaise Valley

- Aime, Le Replat: As part of a larger evaluation project, samples of long bones of six individuals from this site were AMS dated in 2002 (Gély, 2005, 186). They represent almost half of the excavated individuals, and the calibrated radiocarbon data are from the period between 4600 and 4250 BCE. The uncertainties are relatively high, ranging between ± 50 and 60 years (with an average of 58).
- Bourg-Saint-Maurice, Le Châtelard: Three modern radiocarbon dates are available from this small burial site, each with uncertainties of ± 35 years (Rey et al., 2018, 7). The individual from stone cist grave II-1 dates to 4774–4544 cal. BCE, while the bones from the pit grave II-2 (4673–4453 cal. BCE) and the stone cist T1 (4546–4364 cal. BCE) appear to be younger.

Upper Rhône Valley

- Saint-Léonard, Les-Bâtiments: According to Pierre Chorboud, the human remains from the stone cist graves of this site did not contain enough collagen for radiocarbon dating (Corboud et al., 1988, 12). One radiocarbon date was available from a bone sample of Tombe 1, dating to 4352–3970 cal. BCE (Piguet, 2011, 98). With an uncertainty range of ± 100 years, it was not considered for this study.
- Sion, Place et Rue des Remparts: Following the excavation of 2006, eight bone samples from seven graves of this site were radiocarbon dated (Mariéthoz, 2007a,

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Reference	Comment
Aime, Le Replat	Tombe 3	T3.1	Femur	GrA-20641	5620 ± 60	4596-4344	Gély, 2005, 186	
	Tombe 4	T4.1	Femur	GrA-20622	5550 ± 60	4534-4262	Gély, 2005, 186	
	Tombe 5	T5.1	Humerus	GrA-20623	5620 ± 60	4596-4344	Gély, 2005, 186	
	Tombe 5	T5.2	Humerus	GrA-20625	5560 ± 60	4537-4270	Gély, 2005, 186	
	Tombe 6	T6.1	Femur	GrA-20699	5480 ± 50	4446-4243	Gély, 2005, 186	
	Tombe 6	T6.2	Tibia	GrA-20626	5580 ± 60	4541-4335	Gély, 2005, 186	
Bourg-Saint-Maurice, Le Châtelard	II-1	(II-1)	?	Lyon-12316	5800 ± 35	4774-4544	Rey et al. 2018, 7	
	II-2	(II-2)	?	Lyon-13417	5705 ± 35	4673-4453	Rey et al. 2018, 7	
	T1	(T1)	?	Ly-7457	5645 ± 35	4546-4364	Rey et al. 2018, 7	
Saint-Léonard, Les-Bâtiments	Tombe 1	?	?	ARC-416	5340 ± 100*	(4352-3970)	Piguet 2011, 98	Too high uncertainty
Sion, Place et Rue des Remparts	T3	?	Ulna	UtC-15009	5210 ± 50	4233-3947	Mariéthoz 2007, 407	
	T20	3742	Tibia	UtC-15010	5590 ± 50	4536-4344	Mariéthoz 2007, 407	
	T22	3983	Fibula	UtC-15011	5440 ± 70*	(4445-4054)	Mariéthoz 2007, 407	Too high uncertainty
	T21	4009	Tibia	UtC-15012	5580 ± 50	4532-4340	Mariéthoz 2007, 407	
	T5	3451	Fibula	UtC-15013	5100 ± 60	4042-3712	Mariéthoz 2007, 407	
	T24	4570	Femur	UtC-15015	5510 ± 50	4453-4254	Mariéthoz 2007, 407	
	T5	4177	Femur	UtC-15016	5120 ± 60	4049-3716	Mariéthoz 2007, 407	
	T8	?	?	UtC-15008	5120 ± 60	4049-3716	Mariéthoz 2007, 407	
Sion, Sous-le-Scex	Tombe 3	?	?	ETH-17643	5070 ± 65	3985-3659	Honegger 2011, 36	
	Tombe 6	?	?	ETH-16197	5150 ± 65	4224-3777	Honegger 2011, 36	
	Tombe 8	?	?	ETH-17642	5160 ± 60	4222-3792	Honegger 2011, 36	
	Tombe 4	?	?	ETH-16201	5340 ± 60	4331-4000	Honegger 2011, 36	
	Tombe 20	?	?	ETH-16200	5570 ± 65	4544-4268	Honegger 2011, 36	
	Tombe 13	?	?	ETH-16198	5747 ± 75*	(4786-4408)	Honegger 2011, 36	Too high uncertainty
	Tombe 7	?	?	ETH-16202	5575 ± 70*	(4580-4261)	Honegger 2011, 36	Too high uncertainty
	Tombe 24	?	?	ETH-16203	5715 ± 65	4716-4371	Honegger 2011, 36	
Sion, Chemin-des-Collines	Tombe 2	?	?	CRG-1387	5187 ± 168*	(4340-3651)	Moinat et al. 2007, 287	Too high uncertainty
	Tombe 9	?	?	CRG-1388	5367 ± 189*	(4648-3769)	Moinat et al. 2007, 287	Too high uncertainty
	Tombe 10	?	?	GIFTAN-89153	5600 ± 110*	(4711-4246)	Moinat et al. 2007, 287	Too high uncertainty
	Tombe 10	?	?	ARC-404	5430 ± 120*	(4495-3985)	Moinat et al. 2007, 287	Too high uncertainty
	Tombe 11	?	?	ARC-403	5580 ± 120*	(4717-4070)	Moinat et al. 2007, 287	Too high uncertainty
Sion, Avenue-Ritz	Tombe 1	?	?	UTC-14644	5221 ± 35	4224-3959	Moinat et al. 2007, 279	
	Tombe 1	?	?	ARC-405	6050 ± 130*	(5307-4680)	Moinat et al. 2007, 279	Too high uncertainty
	Tombe 6	?	?	ARC-407	5680 ± 140*	(4881-4251)	Moinat et al. 2007, 279	Too high uncertainty
Thonon-les-Bains, Genevray	T757	US878	Femur	Lyon 3213 GrA	5920 ± 45	4933-4702	Baudais et al. 2017, 135	
	T1107	US1195	Femur	Lyon 3222 GrA	5850 ± 40	4834-4556	Baudais et al. 2017, 135	
	T107	US712	Tibia	Lyon 3204 GrA	5840 ± 40	4796-4553	Baudais et al. 2017, 135	
Thonon-les-Bains, Genevray	T22	US785 (101-87)	Femur	Ly-13251	5800 ± 40	4780-4542	Baudais et al. 2017, 135	
	T85	US464 (185)	Femur	Lyon 3202 GrA	5790 ± 40	4777-4538	Baudais et al. 2017, 135	
	T144	US868-339	Tibia	Lyon 3207 GrA	5770 ± 45	4721-4497	Baudais et al. 2017, 135	
	T74	US289 (76-84)	Tibia/Fibula	Lyon 3216 GrA	5775 ± 45	4724-4498	Baudais et al. 2017, 135	
	T93	US703 (433)	Femur	Lyon 3218 GrA	5775 ± 45	4724-4498	Baudais et al. 2017, 135	

Table 1: Previously available radiocarbon dates of the assessed sites (n = 121).

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Reference	Comment
Thonon-les-Bains, Genevray	T905	US929	Femur	Ly-13257	5775 ± 35	4716-4507	Baudais et al. 2017, 135	
	T142	US869-23	Fibula	Lyon 3205 GrA	5765±40	4715-4502	Baudais et al. 2017, 135	
	T961	?	Femur	Lyon 3220 GrA	5760±45	4716-4495	Baudais et al. 2017, 135	
	T1005	US1039-477	Fibula	Lyon 3209 GrA	5720±50	4697-4451	Baudais et al. 2017, 135	
	T89	US541 (ind. 2)	Tibia	Lyon 3197 GrA	5735±45	4701-4458	Baudais et al. 2017, 135	
	T84	US534 (124-146)	Femur/ Humerus	Lyon 3217 GrA	5735±40	4691-4459	Baudais et al. 2017, 135	
	T104	US714 (209-215)	Femur	Lyon 3219 GrA	5740±45	4704-4460	Baudais et al. 2017, 135	
	T66	US589	Tibia	Lyon 3193 GrA	5725±40	4685-4457	Baudais et al. 2017, 135	
	T67	US551	Femur	Lyon 3194 GrA	5705±45	4681-4449	Baudais et al. 2017, 135	
	T15	US725-2	Femur	Lyon 3192 GrA	5700±40	4678-4449	Baudais et al. 2017, 135	
	T12	US184 (ind. 2)	Cranium	Lyon 3191 GrA	5695±40	4678-4447	Baudais et al. 2017, 135	
	T69	194	Femur	Lyon 3215 GrA	5685±45	4678-4371	Baudais et al. 2017, 135	
	T97	US807	Tibia	Lyon 3199 GrA	5635±45	4551-4354	Baudais et al. 2017, 135	
	T1004	US1038-8	Cranium	Lyon 3208 GrA	5645±40	4579-4359	Baudais et al. 2017, 135	
	T133	US18	?	Lyon 3212 GrA	5615±40	4537-4356	Baudais et al. 2017, 135	
	T159	US738-355	Femur	Ly-13253	5600±50	4537-4348	Baudais et al. 2017, 135	
	T72	US453-18	Ulna	Lyon 3195 GrA	5615±45	4537-4356	Baudais et al. 2017, 135	
	T151	US1023	Femur	Ly-13254	5610±40	4536-4354	Baudais et al. 2017, 135	
	T1044	US1070	Tibia	Lyon 3210 GrA	5475±40	4443-4246	Baudais et al. 2017, 135	
	T96	US690	Fibula	Lyon 3198 GrA	5465±45	4443-4175	Baudais et al. 2017, 135	
	T95	US682 (Adult)	Fibula	Lyon 3211 GrA	5445±40	4359-4173	Baudais et al. 2017, 135	
	T86	US543-213	Ulna	Lyon 3196 GrA	5440±40	4358-4172	Baudais et al. 2017, 135	
	T967	?	Cranium	Lyon 3221 GrA	5365±40	4331-4054	Baudais et al. 2017, 135	
	T101	US650	Tibia	Lyon 3201 GrA	5395±40	4342-4059	Baudais et al. 2017, 135	
	T100	US848-19	Tibia	Lyon 3200 GrA	5385±40	4338-4058	Baudais et al. 2017, 135	
	T105	US748	Tibia	Lyon 3203 GrA	5325±40	4321-4046	Baudais et al. 2017, 135	
	T926	US900	Femur	Ly-13255	5290±40	(4243-3991)	Baudais et al. 2017, 135	Bad collagen preservation
	T773	US944	Femur	Ly-13256	5190 ± 75*	(4238-3798)	Baudais et al. 2017, 135	Bad collagen preservation
	T143	US862-199	Ulna	Lyon 3206 GrA	4635 ± 40	3521-3351	Baudais et al. 2017, 135	
	T55	US536-24	Femur	Lyon 3214 GrA	3855 ± 40	2461-2203	Baudais et al. 2017, 135	
	T106	US707	?	Ly-13152	1995 ± 60	(153 BCE-203 CE)	Baudais et al. 2017, 135	
	T88	US513 (132)	Femur	-	-	-	Baudais et al. 2017, 135	Bad collagen preservation
Lugrin, Le Petit-Tronc	(Tombe 1)	?	?	CRG 205	5085 ± 165*	(4325-3532)	Combier 1982, 505	Too high uncertainty
Corseaux-sur-Vevey, En-Seyton	T4-1973	Sq. 24	?	B-4817	4760 ± 80*	(3697-3367)	Baudais & Kramar 1990, 47	Too high uncertainty
Pully, Chamblandes	T50	?	?	CRG-522	5055 ± 80*	(3986-3652)	Moinat 2007, 205	Too high uncertainty
	T61	?	?	UTC-7158	5275 ± 45	4240-3984	Moinat 2007, 205	
	T71	?	?	UTC-7160	5292 ± 44	4249-3988	Moinat 2007, 205	
	T62	?	?	UTC-7161	5400 ± 44	4345-4058	Moinat 2007, 205	
	T67	?	?	UTC-7159	5420 ± 43	4353-4066	Moinat 2007, 205	
	ST2	?	?	CRG-545	5485 ± 120*	(4589-3996)	Moinat 2007, 205	Too high uncertainty

Table 1 continued.

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Reference	Comment
Lausanne, Vidy	T71	?	?	ETH-8594	4630 ± 60	3626-3106	Moinat 2007, 201	
	T37	?	?	UZ-5224	4835 ± 55	3762-3383	Moinat 2007, 201	
	T114	?	?	UZ-5221	5170 ± 55	4223-3799	Moinat 2007, 201	
	T35	?	?	UZ-5223	5210 ± 60	4237-3813	Moinat 2007, 201	
	T87	?	?	UTC-13903	5213 ± 48	4230-3951	Moinat 2007, 201	
	T53	?	?	ETH-8593	5245 ± 60	4241-3959	Moinat 2007, 201	
	T136	?	?	UtC-13904	5310 ± 60	4324-3988	Moinat 2007, 201	
	T98	?	?	UZ-5222	5345 ± 60	4332-4004	Moinat 2007, 201	
	T149	?	?	UTC-13905	5348 ± 42	4334-4045	Moinat 2007, 201	
	T13	?	?	UTC-13901	5350 ± 50	4330-4049	Moinat 2007, 201	
	T94	?	?	UTC-13908	5360 ± 60	4335-4049	Moinat 2007, 201	
	T44	?	?	ETH-8592	5370 ± 75*	(4348-3998)	Moinat 2007, 201	Too high uncertainty
	T74	?	?	UTC-13906	5403 ± 43	4346-4059	Moinat 2007, 201	
	T79	?	?	UTC-13907	5485 ± 43	4445-4249	Moinat 2007, 201	
	T6	?	?	UTC-13900	5540 ± 50	4492-4266	Moinat 2007, 201	
	T77	?	?	UTC-13902	5581 ± 47	4531-4341	Moinat 2007, 201	
Lenzburg, Goffersberg	FM	Kammer 2	Tooth	ETH 17598	4980 ± 65	3946-3645	de Capitani 2007, 225	
	FM	Kammer 6	Tooth	ETH 17599	4860 ± 60	3785-3519	de Capitani 2007, 225	
	SKG 4	Indiv. I	Tooth	ZU 4011	-	-	de Capitani 2007, 225	No collagen
	SKG 4	?	Tooth	ZU 4012	-	-	de Capitani 2007, 225	No collagen
	SKG 8	Ind. I	Tooth	ETH 17602	5455 ± 60	4446-4065	de Capitani 2007, 225	
	SKG 8	Ind. IX	Tooth	ETH 17601	5420 ± 65	4438-4052	de Capitani 2007, 225	
	SKG 12	Ind. I	Tooth	ETH 16455	5425 ± 60	4437-4054	de Capitani 2007, 225	
	SKG 13	? (oberes Ind.)	Tooth	ETH 17600	5380 ± 60	4342-4051	de Capitani 2007, 225	
	SKG 13	?	Tooth	ZU 4009	-	-	de Capitani 2007, 225	No collagen
Niederried, Ursisbalm	(Grab 1)	NID A1	Pars Petrosa	BE-7984.1.1	5537 ± 22	4445-4341	Siebke 2019, 106	
	(Grab 1)	NID A2	Pars Petrosa	BE-8011.1.1	5587 ± 22	4455-4355	Siebke 2019, 106	
	(Grab 1)	NID A3	Femur	BE-7439.1.1	5624 ± 30	4537-4362	Siebke 2019, 106	
Montagnieu, Grotte-du-Souhait	Sp1	1-I	?	Lyon-3026	5385 ± 40	4338-4058	BANADORA	
	Sp1	1-II	?	Lyon-3027	5330 ± 40	4323-4047	BANADORA	
	Sp4	4-I	?	Lyon-3028	5440 ± 40	4358-4172	BANADORA	
	Sp4	4-II*	?	Lyon-3029	5315 ± 35	4314-4046	BANADORA	
	Sp5	5-II	?	Lyon-3030	5370 ± 40	4333-4054	BANADORA	
	Sp5	5-III	?	Lyon-3031	5325 ± 40	4321-4046	BANADORA	
	Sp5	(5-VI)	?	Lyon-3032	5475 ± 40	4443-4246	BANADORA	
	Sp5	(5-VIII)	?	Lyon-3033	5315 ± 40	4316-3999	BANADORA	
	Sp6	6-I	?	Lyon-3034	5470 ± 40	4442-4243	BANADORA	
	Sp6	6-II	?	Lyon-3035	5430 ± 40	4355-4082	BANADORA	
	Sp6	6-III	?	Lyon-3036	5470 ± 35	4437-4249	BANADORA	

Table 1 continued.

407). They consist of four samples from collective burials in stone cists (two from T5 and one each from T3 and T8), two samples from single burials in stone cists (T20 and T24), and two samples from burials in graves with wooden casting (T21 and T22). The results indicate two distinct phases of burial activity: first, the single burials around 4500 to 4250/4050 BCE, with no clear chronological differentiation between the used grave architecture of stone slabs or wooden planks; and second, the samples originating from collective graves dating into a younger period between 4050 and 3700 BCE. Only one sample from the collective grave T3 dates between these two phases (4233–3947 cal. BCE). These dates, however, have relatively high uncertainty ranges of ± 50–70 years (with an average of 56 years), especially the sample from T22, with a range of ± 70 years. Therefore, it was not used further in this study.

- Sion, Sous-le-Scex: Eight bone samples from eight graves were radiocarbon dated (Honegger, 2011, 36). The samples represent half of the total of 16 graves excavated at this site and originate from burials found in layers 18 to 15. They date between 4800 and 3800/3650 BCE, further demonstrating the long period of use of this necropolis. These dates also have relatively high uncertainty ranges between ± 60 and 75 years. In this context, the two samples from graves T7 and T13 with ranges over ± 65 years will not be considered for this study.
- Sion, Chemin-des-Collines: Five bone samples from three graves of this site were radiocarbon dated (Moinat et al., 2007a, 286–287). They date to a period between 4700 and 3650 BCE, but due to very high uncertainty ranges between ± 110 and 189 years, they will not be considered.
- Sion, Avenue Ritz: Two bone samples from graves T1 and T6 were radiocarbon dated between 5300 and 4250 BCE. But with very high uncertainty ranges between ± 130 and 140 years, they will not be used for this study. However, one more recent radiocarbon date with an uncertainty range of ± 35 years is available for T1, dating between 4224 and 3959 cal. BCE (Moinat et al., 2007a, 279–280).

Lake Geneva South

- Thonon-les-Bains, Genevray: To clarify the chronology of this vast necropolis, long bone samples of 40 graves were analysed, consisting of five conventional and 35 AMS dates (Baudais et al., 2017, 134–138). Out of these 40 radiocarbon dates, at least three samples (from graves T88, T773, and T926) will not be considered, due to reportedly bad collagen preservation. Overall, a valid radiocarbon date was available for over half of the anthropologically studied graves (n = 68), with uncertainty ranges between ± 40 and 60 years (with an average of 43). The majority of the samples date between 4950 and 4050 BCE. Three yielded significantly younger radiocarbon results: T143 (3521–3351 cal. BCE), T55 (2461–2203 cal. BCE), and T106 (153 cal. BCE–203 cal. BCE). These results suggest that the graves without stone slab construction started around 4900 BCE, while stone cists occurred only after 4800 BCE. After 4800 BCE, both grave architectures occurred simultaneously next to each other over the whole period of use of the necropolis. About half of the radiocarbon dates between 4800 and 4400 BCE originate from graves containing at least three individuals. These are multiple and collective graves with primary, successive burials. Primary single burials represent about one-third of the sampled individuals of this older usage phase of the necropolis. In contrast, simultaneous multiple burials could no longer be detected after around 4400 BCE. In addition, the proportion of double burials decreased from about 50% between 4800 and 4400 BCE to only a quarter of the sampled graves. On the basis of the available data, an increase of single graves as well as complex collective graves (with reductions and secondary burials) in the younger graves dating after 4400 BCE was suggested.

- Lugrin, Le Petit-Tronc: One bone sample from the stone cist grave was dated to 4325–3532 cal. BCE (Combier, 1982, 505). Due to the very high uncertainty range of ± 165 years, it will not be considered in this study.

Lake Geneva North

- Corseaux-sur-Vevey, En-Seyton: Only one radiocarbon date was previously available for this necropolis (Baudais and Kramar, 1990, 47). The sample originates from the adult female individual from grave T4-1973 (Sq. 24) and dates in the relatively young period of 3697–3367 cal. BCE. However, with an uncertainty range of ± 80 years, it was not used further for this study.
- Pully, Chamblandes: Radiocarbon dates are available for six human bone samples from six stone cist graves (Moinat, 2007, 205). The dates from graves T50 and ST2 have uncertainty ranges of ± 80 and 120 years; therefore, they will not be used for the study. The remaining four samples date from the period of 4350–4000 BCE with uncertainty ranges of ± 43–45 years.
- Lausanne, Vidy: A total of 16 radiocarbon dates from 16 grave structures of this vast necropolis are available (Moinat, 2007, 200–201). They date largely to the period of 4550 to 3800 BCE. Only the two samples from T37 (3762–3383 cal. BCE) and T71 (3626–3106) appear to be from a younger usage phase of the necropolis. These dates have relatively high uncertainty ranges between ± 42 and 60 years (with an average of 53), especially the sample from T44, which was excluded from the study due to an uncertainty range of ± 75 years. The samples originate from graves with and without stone slab construction and single as well as collective graves (Jungnickel, 2019, Slide 6).

Swiss Plateau

- Lenzburg, Goffersberg: Nine human bone samples were radiocarbon dated. They originate from four stone cists and two chambers of the funerary monument (de Capitani, 2007a, 225–226). Three of those did not provide valid results, since no collagen could be extracted from the samples. The remaining six valid radiocarbon samples show relatively high uncertainty ranges of ± 60–65 years. These results situate the stone cist graves in the period between 4450 and 4000 BCE, while the burials in the funerary monument appear to be from a younger time period (between 3950 and 3500 BCE).
- Wettingen, Schartenstrasse: According to communication with Kurt Zuber, Head of Collections of the Historical Museum Baden (Aargau, Switzerland, 2021), two attempts of radiocarbon dating human remains from this stone cist grave (between 1999 and 2002) did not provide valid results, because no collagen could be extracted from the samples.

Peripheral sites

- Niederried, Ursisbalm: Three human bone samples from this stone cist grave were analysed, one from the individual within the grave (NID A1) and two from the bones found next to the cist (NID A2 and NID A3) (Siebke, 2019, 106). The radiocarbon dates exhibit very low uncertainty ranges between ± 22 and 30 years. Their calibrated results are close to each other and overlap in the time period between 4500 and 4350 BCE. Slight differences can be observed, as NID A1 is younger than the bone samples found outside the grave.
- Montagnieu, Grotte-du-Souhait: A total of 11 radiocarbon dates of bone samples from four graves are available from this necropolis (BANADORA). Overall, they date in the period of 4450–4050 BCE with uncertainty ranges between ± 35 and 40 years. On the online database BANADORA, the dates of Sp4 are given as Ind. 1 and 4. Since this grave contained only two burials, the second dating stems more likely from individual 4-II. In addition, the dates of 5-VI and 5-VIII have been placed in parentheses in Table 1 because the assignment to these individuals is unclear. Due to its stratigraphic

position below the other graves, it was assumed that Sp1 could be the oldest on the site. The radiocarbon data of the two individuals 1-I and 1-II do not support this. In addition, the fine sediment layer between these two burials was seen as an indication that the individuals were not buried at the same time, especially since the raw date of 1-I is slightly older than that of 1-II (5385±40 BP vs. 5330±40 BP). Two dates are available for the burials from Sp4, of particular interest being individual 4-II with its reversed placement (skull towards the south). In fact, the raw dates of the two individuals show a difference of 125 years and a simultaneous burial is thus questionable. The primary burials in grave Sp5 (5-II and 5-III) are relatively contemporaneous. In contrast, one sample originating from the grave fill (5-VI) appears to be slightly older than the primary burials below. Finally, one valid radiocarbon date is available for all three individuals from grave Sp6, and the raw dates indicate a simultaneous burial.

5.2. Sampling strategy

As described in Steuri et al. (2023), first, the available archaeological and anthropological documentation for each evaluated site was screened. Second, Marco Miella from the Department of Physical Anthropology of the University of Bern re-evaluated the available human remains for basic demographic parameters: he estimated the age at death for the adults based on the morphological changes of the pubic symphysis and auricular surface of the ilium (Brooks and Suchey, 1990; Buckberry and Chamberlain, 2002). For nonadults, he estimated age at death based on the development and eruption of deciduous and permanent teeth and the degrees of epiphyseal fusion (Schaefer et al., 2009; Scheuer and Black, 2000). The sex was determined for adult remains only, following standard anthropological methods based on the sexually dimorphic features of the pubic symphysis, coxal bone, cranium, and mandible (Buikstra and Ubelaker, 1994). These anthropological data were necessary to establish the correct identification of the sampled human remains with recorded grave and/or individual numbers.

As the specific sampling strategy varied due to a multitude of factors (e.g. availability and preservation of the human remains or the state of research/collaboration), this section is subdivided into the defined geographical zones (Figs. 10 and 142).

Aosta Valley

For the assessment of the sites and the subsequent extraction of human bone samples for radiocarbon dating, a close collaboration with the archaeological department of the region of Aosta (Soprintendenza di Aosta) was established in 2020.

Since an anthropological assessment of the stone cist graves was mostly missing, the sampling strategy for radiocarbon dating was based on individuals assignable to a specific grave. In addition, the aim was to minimise possible age or sex biases in the selected samples. For each individual, we collected a bone sample of approximately three grams, taken from the petrous portion of the temporal bone. We targeted this anatomical region since a) this region presents a good portion of highly mineralised compact bone which makes it ideal for sampling (Lösch et al., 2020), and b), it allows to minimise the risk of double-sampling. In the few cases where more than one individual was buried in a grave, double sampling was avoided by considering only temporal bone from one side and/or belonging to individuals of obviously different ages at death (i.e. adults vs. nonadults). These criteria led to the following sample composition collected in September 2020 (Fig. 143.1):

- Eleven individuals from ten graves of the Villeneuve necropolis corresponding to approximately a third of all the graves (n = 33),

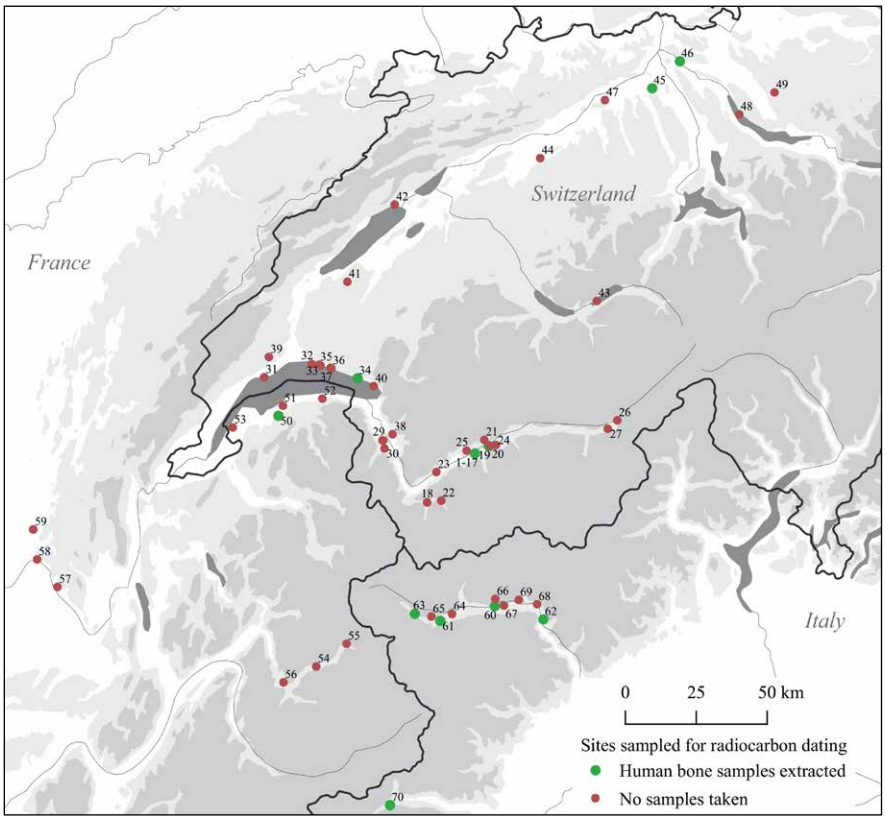


Figure 142: Map depicting Chamblandes-type sites sampled for radiocarbon dating.

- Twelve individuals from eight graves of Vollein could be sampled which corresponds to about 12% of the necropolis,
- Among the rediscovered bones, labelled to be from the stone cist grave found in Derby, three individuals could be distinguished and sampled.

In August 2021, the few remaining human bones from the site of Montjovet (stored in the Musei Reali in Torino, Italy) were examined by the laboratory of Ancient DNA of the University of Bologna, and one gram of four petrous bones could be sampled. It was not possible to assign these bones to specific individuals or graves outlined in the archaeological documentation. The human remains were heavily disturbed and three of the five graves were destroyed during the Second World War (Fumagalli, 1955, 109). Further, as a surprise, in April 2022, one complete stone cist grave with the human remains of one individual in its original position was rediscovered in the archive of the Musei Reali in Torino and subsequently sampled for this study.

Tarentaise Valley

No additional samples were extracted from sites located in this zone. Considering the relatively high uncertainty ranges of the samples from Aime, Le Replat, new radiocarbon data would be desirable. According to communication by Pierre J. Rey in 2020, the human remains of this site are poorly preserved and partially mixed. In addition, the labelling of the graves seems to have been changed between the excavation and publication, which further complicates a clear assignment of the bones to individual/grave numbers.

Upper Rhône Valley

The sampling strategy for the sites in the Upper Rhône Valley had to be modified, as access to the archaeological record and human remains was limited. In addition, the archaeology department of the canton of Valais insisted on extracting the samples

and, subsequently, the collagen itself (see sample treatment 5.3). Based on the archaeological features, the two principal sites chosen for additional radiocarbon analysis were Saint-Léonard, Les-Bâtiments and Sion, Place et Rue des Remparts. Additionally, samples were extracted from three outlined sites in the municipality of Sion. In October 2021, the following samples were received:

- Six individuals from two of the three graves of Saint-Léonard were sampled. Four originate from Tombe 1 and two from Tombe 2 and represent more than half of the total of 11 individuals on this site.
- 15 samples from six graves were extracted from the necropolis of Sion, Place et Rue des Remparts. 13 originate from different individuals of the four collective stone cists, representing 38% of the total 34 individuals from these graves.
- Three samples from three graves were extracted from the necropolis of Sion, Avenue-Ritz, corresponding to 21% of the site.
- All three individuals from grave T3 from the small grave group of Sion, Montorge were sampled.
- Four samples from four individuals were extracted from the single stone cist of Sion, En-Corbassière, amounting to 29% of the total 14 individuals.

Figure 143: N. Steuri during the extraction of human bone samples for radiocarbon dating: 1) in Aosta (Italy) and 2) in Lenzburg (Switzerland).

Lake Geneva South

The focus for additional radiocarbon dating in this region was exclusively on the vast necropolis of Thonon-les-Bains, Genevray. For this purpose, a collaboration with the archaeological department of the region of Auvergne-Rhône-Alpes (Service Régional de l'Archéologie de la region Auvergne-Rhône-Alpes) was established in January 2020.

Grave structures of special interest for new dates were identified based on the archaeological record and the existing set of radiocarbon dates. A special focus was on redating the individuals yielding radiocarbon ages older than 4650 BCE and younger than 4000 BCE. In addition, the usage period(s) of the collective graves was assessed. Finally, the reported state of preservation of the individual human remains from these graves was considered regarding collagen preservation (as reported in Baudais et al., 2017).

As described for the samples from Aosta, the available human remains from the selected graves were assessed in September 2021, and samples of 1.5 to 2 grams of different long bones clearly assignable to specific individuals and grave structures were extracted. In total, 21 additional individuals from ten grave structures (eight stone cists and two wooden cists) were sampled.

Lake Geneva North

To date, not all necessary archaeological and anthropological data of the two large necropolises of this region, Pully, Chamblandes, or Lausanne, Vidy, are available. Therefore, the focus for additional radiocarbon dates was on the well-studied site of Corseaux-sur-Vevey, En-Seytion, especially, since the only available radiocarbon date situates this site in the middle of the fourth millennium BC, which appears to be too recent given the other radiocarbon data from this grave type.

In January 2021, a total of 18 samples of long bones could be extracted from eight graves, corresponding to over a third (37.5%) of the total of 48 individuals buried in this necropolis.

Swiss Plateau

The sampling strategy for additional radiocarbon dating in this region focused on the necropolis of Lenzburg, Goffersberg with the special aim of assessing the usage period(s)

of the collective graves. The human remains from this site were dispersed and first had to be (re)located. In addition, the intermixing of bones, the partial lack of clear labelling on the bones, as well as the limited anthropological documentation available, posed some difficulties, as only samples from clearly identifiable individuals could be extracted. The sample extraction was further limited by the fact that no bone samples could be taken from the stone cist graves used as museum objects (SKG 4, 8, 9 and 12). These limitations led to the following sample composition:

- Within the framework of this study, the bones of most stone cist graves from the Lenzburg site were rediscovered in the anthropological collection of the University of Zurich. In September 2020, these human remains were screened with Marco Milella, and 15 samples of long bones from six graves were extracted.
- The human remains from three graves (SKG 5, 10 and 13) were located in the archive of the archaeology department of the canton of Aargau. In December 2020, a total of three additional samples were collected.
- As part of her PhD-project, Inga Siebke (Siebke, 2019) sampled three individuals (two from SKG 8 and one from SKG 5) from the necropolis of Lenzburg in 2017. Fortunately, enough sample material was still available from these analyses to conduct radiocarbon dating.

In total, 21 samples from eight graves, representing half of the total of the 16 stone cists of this site, were extracted (Fig. 143.2).

Regarding the other sites from this zone, only one bone sample from the isolated stone cist grave of Wettingen, Schartenstrasse was available from the analyses done by Inga Siebke. Radiocarbon data of the site of Däniken, Studenweid would have been of interest, however, even after extensive investigation, too few human remains from these stone cist graves were available. In addition, the human remains from the graves of Erlenbach, Geren, could not be located (as they are missing in the archive of the Swiss National Museum).

Peripheral sites

Regarding the sites located at the peripheries of the defined geographical zones, the focus for radiocarbon dates was exclusively on Chiomonte, La-Maddalena, since the available data from Niederried and Montagnieu were regarded as sufficient. Additionally, the site of Chiomonte was of great interest for precise dating, especially due to it marking the southern extent of the Western Alpine cist graves.

After lengthy research in the context of this study, the human remains of the stone cists of Chiomonte could be (re)located in the archives of the Musei Reali in Turin. To sample the petrous portion of the temporal bone of the available human remains, cooperation with several partners of the Universities of Turin and Bologna and the Musei Reali followed. In June 2021, five samples from different grave structures were obtained, representing half of the individuals and stone cists of the necropolis.

5.3. Bone sample treatment

As described in Steuri et al. (2023), the extracted bone samples were processed in the laboratory of the Department of Physical Anthropology (IRM) of the University of Bern and transferred to the Laboratory for the Analysis of Radiocarbon with AMS (LARA) of the University of Bern for dating (Fig. 144). The sample preparation was slightly adapted from Szidat et al. (2017) by implementing an ultrafiltration step. In short, the bones were cleaned by ultrasonication in ultra-pure water and ground to 0.5–1 mm with a ball mill. The chemical treatment included the following steps: 0.5 mol/L hydrochloric acid (HCl)

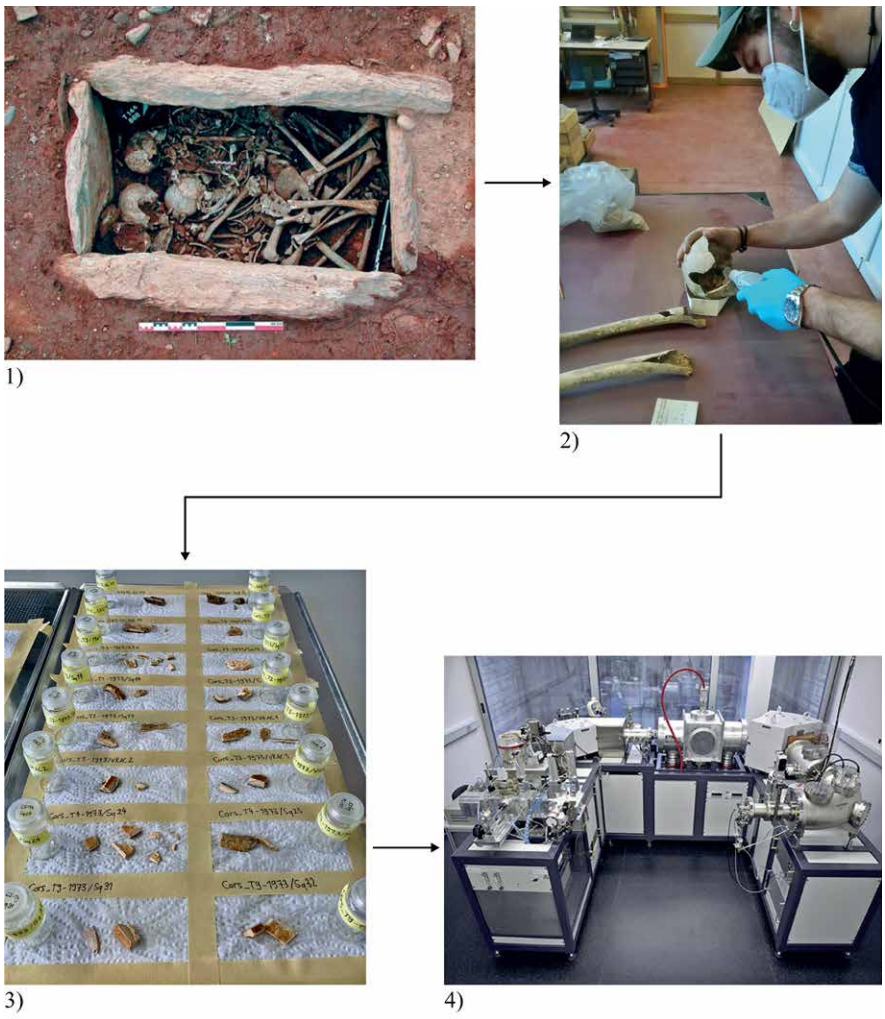


Figure 144: Diagram of the sampling and radiocarbon dating process: 1) evaluation of available human remains, 2) extraction of 1–2 grams of bone (temporal bone or long bone), 3) sample preparation (collagen extraction), 4) 14C measurement at LARA (source: © Baudais et al. 2017, 14c.unibe.ch).

for 60 hr, 0.25 mol/L sodium hydroxide (NaOH) for 1 hr, 0.5 mol/L HCl for 1 hr, followed by a gelatinisation in diluted HCl at pH 3 and 60°C overnight. The warm solution was filtered using precleaned Ezee-Filters, ultrafiltration was performed with Vivaspin™ 15 30 kDa molecular weight cut-off (MWCO) ultrafilters (Sartorius), and the high-molecular-weight fraction was lyophilised. The extracted collagen was combusted and graphitised with automated graphitisation equipment (AGE). The ^{14}C measurements were performed with the MICADAS accelerator mass spectrometry (AMS) system using ^{14}C-free sodium acetate and NIST standard oxalic acid II (SRM 4990C) for blank subtraction, standard normalisation, and correction for isotope fractionations (Szidat et al., 2014).

The protocol differed slightly for the samples from the Upper Rhône Valley, since the archaeological department of the canton of Valais insisted on extracting the collagen itself. The main difference to our protocol was that the ultrafiltration step was not implemented. The samples from sites of the Upper Rhône Valley were taken from long bones (humerus or ulna) and underwent a mechanical cleaning by abrasion, followed by an ultrasonic bath in purified water. Afterwards, they were demineralised with 0.5M HCl until complete demineralisation. This was followed by treatment with 0.125M NaOH for 20 hours. Solubilisation took place in 0.01M HCl at a temperature of 70°C for 48 hours, followed by filtration and freezing at –80°C (lyophilisation). The extracted collagen was analysed at LARA Bern, following the same treatment as for the other samples.

In order to test the validity and quality of the extracted collagen from the samples received from sites of the Upper Rhône Valley, a comparative test was performed.

Initially, the C% values and the C/N ratios were assessed and the processing was rated as sufficient. Afterwards, the extracted collagen of the selected samples with enough material available after the initial dating was again dissolved and ultrafiltration was performed. The collagen was reisolated and dated again. For this second control group, no age difference to the initial dating of these samples should be noticeable.

Calibration and plots of the raw data were conducted with Oxcal 4.4.4 software (Bronk Ramsey, 2009) using the IntCal20 atmospheric curve (Reimer et al., 2020). The two-sigma probability interval was used when discussing the radiocarbon results (as recommended by Millard, 2014). Quality control for the radiocarbon data focused on the atomic C/N ratio and the collagen yield (%w/w) (Szidat et al., 2017; van Klinken, 1999). Sufficient collagen preservation of bone samples is indicated by a C/N ratio between 3.10 and 3.30 and collagen yields ≥0.5%. In contrast to earlier work (Szidat et al., 2017), we narrowed the range of the C/N ratio conservatively to 3.10–3.30. This decision was based on the fact that the distribution of acceptable bone samples falls into these boundaries, whereas C/N ratios above 3.30 may occasionally show biased results.

5.4. Results

The radiocarbon results of the analysed bone samples are covered in this subchapter, and the details of the dates are listed in Table 2.

Aosta Valley

From the 31 samples from four sites, the ^{14}C laboratory of the University of Bern (LARA) was able to generate 25 valid results. These are made up as follows (Fig. 145):

- Villeneuve, Champ Rotard: A valid result of 64%, or seven out of eleven samples, could be obtained. The remaining four did not meet the quality control criteria (stated in Chapter 5.3) and were rejected. Thus, a valid ^{14}C date is available for 21% of the 33 stone cist graves from the Villeneuve necropolis. The raw dates (n = 7) are almost identical, providing dates falling in the range between 4720 and 4550 BCE, with the exception of the slightly older individual from T17 (4798–4681 cal. BCE).
- Quart, Vollein: For all samples (n = 12), a valid result was present. Right after the excavation, the bones were stored unwashed and untreated, which might explain the good collagen preservation. The data of the bone samples show a larger spread than the ones from Villeneuve. The oldest date belongs to the individual from grave T31 (4611–4455 cal. BCE). The youngest result is from individual 1 of grave T50 (4442–4265 cal. BCE). Based on the age determination of individual 2 from T50 (4445–4332 cal. BCE), which is assumed to have been buried at the same time as individual 1, dating to the 43rd century BCE is rather unlikely. Apart from this exception, the analysis dates the graves between 4600 and 4350 BCE.
- La Salle, Derby: All three samples could be successfully dated. The dates of individuals 1 and 2 are almost identical, falling into the period between 4700 and 4450 BCE. Individual 3 was dated to the Early Medieval period, and it can be assumed that this third skull fragment does not originate from the Neolithic stone cist. Therefore, this result was not considered further.
- Montjovet, Fiusey: Three of the five analysed samples yielded a valid radiocarbon result. With results providing ranges between 435 and 775 CE, these were not considered further for this investigation. Based on the archaeological record, Late Antique or Early Medieval dating for these graves seems highly unlikely, and a partial mixup with bones from the overlying cemetery during the long and disturbed storage of these human remains is most plausible.

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Comment
Villeneuve, Champ Rotard	T4	(Ind. 1)	Temporal bone (petrous portion)	BE-14327.1.1	-	-	3.23	43.3	0.4*	gelatin yield too low
	T5	(Ind. 1)	Temporal bone (petrous portion)	BE-14328.1.1	5789 ± 28	4713-4550	3.20	44.0	0.8	
	T7	(Ind. 1)	Temporal bone (petrous portion)	BE-14329.1.1	5787 ± 28	4711-4550	3.20	44.0	2.0	
	T8	(Ind. 1)	Temporal bone (petrous portion)	BE-14330.1.1	5799 ± 28	4719-4550	3.24	44.2	1.2	
	T10	(Ind. 1)	Temporal bone (petrous portion)	BE-14331.1.1	5801 ± 28	4721-4550	3.21	43.8	1.3	
	T11	(Ind. 1)	Temporal bone (petrous portion)	BE-14332.1.1	-	-	3.29	43.6	0.3*	gelatin yield too low
	T16, Ind. 1	(Ind. 1)	Temporal bone (petrous portion)	BE-14333.1.1	-	-	3.39*	44.5	1.0	C/N too high
	T16, Ind. 2	(Ind. 1)	Temporal bone (petrous portion)	BE-14334.1.1	5804 ± 25	4722-4551	3.24	44.6	3.0	
	T17	(Ind. 1)	Temporal bone (petrous portion)	BE-14335.1.1	5866 ± 25	4798-4681	3.30	43.4	1.3	
	T23	(Ind. 1)	Occipital bone	BE-14336.1.1	-	-	3.33	39.5	0.1*	gelatin yield too low
	T25	(Ind. 1)	Temporal bone (petrous portion)	BE-14337.1.1	5798 ± 25	4718-4551	3.23	43.5	1.0	
Quart, Vollein	T1	(Ind. 1)	Temporal bone (petrous portion)	BE-14338.1.1	5633 ± 25	4537-4367	3.21	43.1	1.4	
	T7	Ind. 1	Temporal bone (petrous portion)	BE-14339.1.1	5614 ± 25	4498-4360	3.22	43.7	2.1	
	T7	Ind. 2	Temporal bone (petrous portion)	BE-14340.1.1	5605 ± 31	4496-4356	3.21	44.6	2.9	
	T7	?	Temporal bone (petrous portion)	BE-14341.1.1	5590 ± 26	4487-4355	3.24	43.3	1.0	
	T15	Ind. 1	Temporal bone (petrous portion)	BE-14342.1.1	5573 ± 25	4451-4352	3.23	43.7	2.1	
	T15	Ind. 2	Temporal bone (petrous portion)	BE-14343.1.1	5576 ± 27	4454-4351	3.21	44.3	1.6	
	T25	(Ind. 1)	Temporal bone (petrous portion)	BE-14344.1.1	5594 ± 25	4489-4356	3.19	44.1	2.0	
	T30	(Ind. 1)	Temporal bone (petrous portion)	BE-14345.1.1	5566 ± 25	4449-4352	3.22	44.1	0.7	
	T31	(Ind. 1)	Temporal bone (petrous portion)	BE-14346.1.1	5704 ± 25	4611-4455	3.18	44.2	2.3	
	T50	Ind. 1 (E)	Temporal bone (petrous portion)	BE-14347.1.1	5499 ± 25	4442-4265	3.27	43.7	0.8	
	T50	Ind. 2 (W)	Temporal bone (petrous portion)	BE-14348.1.1	5517 ± 25	4445-4331	3.26	43.7	1.0	
	T55	(Ind. 1)	Temporal bone (petrous portion)	BE-14349.1.1	5529 ± 25	4446-4337	3.23	44.1	1.1	
La Salle, Derby	(1)	Ind. 1	Temporal bone (petrous portion)	BE-14324.1.1	5737 ± 28	4681-4498	3.29	42.6	0.7	
	(1)	Ind. 2	Temporal bone (petrous portion)	BE-14325.1.1	5717 ± 28	4675-4458	3.28	43.6	1.2	
	(1)	Ind. 3	Temporal bone (petrous portion)	BE-14326.1.1	1270 ± 25	668-821 (CE)*	3.21	44.1	3.5	
Montjovet, Fiusey	Sep. 1	(Ind. 1)	Tooth	BE-19220.1.1	-	-	3.34*	40.2	0.21*	gelatin yield too low, C/N too high
	?	351 D	Temporal bone (petrous portion)	BE-17005.1.1	-	-	3.37*	45.7	0.9	C/N too high

Table 2: New radiocarbon dates of the assessed sites (n = 138).

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Comment
Montjovet, Fiusey	?	352 D	Temporal bone (petrous portion)	BE-17006.1.1	1291 ± 22	666-774 (CE)*	3.25	45.6	3.2	
	?	352 S	Temporal bone (petrous portion)	BE-17007.1.1	1366 ± 22	611-759 (CE)*	3.26	45.2	3.3	
	?	354 S	Temporal bone (petrous portion)	BE-17008.1.1	1543 ± 22	435-591 (CE)*	3.29	44.7	3.3	
Saint-Léonard, Les-Bâtiments	T1	Ind. 1	Long bone (Ulna)	BE-17889.1.1	-	-	3.31*	33.8	-	C/N too high
	T1	Ind. 2	Long bone (Humerus)	BE-17890.1.1	5332 ± 24	4314-4052	3.25	37.1	-	collagen extracted by Valais
	T1	Ind. 3	Long bone (unclear)	BE-17891	-	-	-	-	-	no collagen
	T1	Ind. 4	Long bone (unclear)	BE-17892	-	-	-	-	-	no collagen
	T2	Ind. 1	Long bone (Humerus)	BE-17893	-	-	-	-	-	no collagen
	T2	Ind. 2	Long bone (Humerus)	BE-17894	-	-	-	-	-	no collagen
Sion, Place et Rue des Remparts	T3	(2563)	Long bone (Humerus)	BE-15251.1.1	5122 ± 28	3984-3803	3.16	39.7	-	collagen extracted by Valais
	T3	(2638)	Long bone (Humerus)	BE-17895.1.1	5302 ± 26	4240-4046	3.23	41.5	-	collagen extracted by Valais
	T3	(2638)	Long bone (Humerus)	BE-17895.2.1	5249 ± 24	4226-3979	3.24	45.8	-	subsequent ultrafiltration
	T3	(3615)	Long bone (Humerus)	BE-17896.1.1	5343 ± 25	4319-4053	3.22	43.4	-	collagen extracted by Valais
	T3	(3615)	Long bone (Humerus)	BE-17896.2.1	5343 ± 25	4319-4053	3.23	46.3	-	subsequent ultrafiltration
	T4	(1023)	Long bone (Humerus)	BE-17897.1.1	5323 ± 25	4247-4050	3.24	36.3	-	collagen extracted by Valais
	T4	(1704)	Long bone (Humerus)	BE-15252.1.1	5209 ± 33	4217-3957	3.18	34.7	-	collagen extracted by Valais
	T5	(3020)	Long bone (Humerus)	BE-15253.1.1	5227 ± 29	4221-3965	3.20	40.6	-	collagen extracted by Valais
	T5	(3020)	Long bone (Humerus)	BE-15253.2.1	5243 ± 29	4227-3974	3.24	43.2	-	subsequent ultrafiltration
	T5	(3068)	Long bone (Humerus)	BE-17898.1.1	5266 ± 45	4238-3979	3.24	29.8	-	collagen extracted by Valais
	T5	(3081)	Long bone (Humerus)	BE-17899	-	-	-	-	-	no collagen
	T5	(3085)	Long bone (Humerus)	BE-17900.1.1	5242 ± 25	4225-3976	3.24	34.7	-	collagen extracted by Valais
	T5	(4154)	Long bone (Humerus)	BE-17901.1.1	5267 ± 24	4230-3988	3.20	39.6	-	collagen extracted by Valais
	T5	(4154)	Long bone (Humerus)	BE-17901.2.1	5305 ± 25	4240-4047	3.23	45.2	-	subsequent ultrafiltration
	T8	(2414)	Long bone (Humerus)	BE-17902.1.1	5325 ± 24	4248-4051	3.24	41.6	-	collagen extracted by Valais
	T8	(2414)	Long bone (Humerus)	BE-17902.2.1	5332 ± 25	4314-4052	3.26	46.4	-	subsequent ultrafiltration

Table 2 continued.

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Comment
Sion, Place et Rue des Remparts	T8	(2431)	Long bone (Humerus)	BE-17903.1.1	5258 ± 24	4228-3985	3.24	37.8	-	collagen extracted by Valais
	T8	(2486)	Long bone (Humerus)	BE-15254.1.1	5224 ± 30	4221-3963	3.17	39.7	-	collagen extracted by Valais
	T8	(2486)	Long bone (Humerus)	BE-15254.2.1	5279 ± 29	4235-3992	3.24	45.3	-	subsequent ultrafiltration
	T25	(Ind. 1)	Long bone (Humerus)	BE-15255.1.1	5595 ± 30	4494-4353	3.16	44.2	-	collagen extracted by Valais
	T25	(Ind. 1)	Long bone (Humerus)	BE-15255.2.1	5630 ± 29	4537-4365	3.22	46.7	-	subsequent ultrafiltration
	T26	(Ind. 1)	Long bone (Humerus)	BE-15256.1.1	5579 ± 39	4493-4345	3.17	40.6	-	collagen extracted by Valais
	T26	(Ind. 1)	Long bone (Humerus)	BE-15256.2.1	5684 ± 30	4606-4449	3.25	45.7	-	subsequent ultrafiltration
Sion, Avenue-Ritz	T4	?	Long bone (Humerus)	BE-17879.1.1	5670 ± 25	4584-4408	3.19	41.3	-	collagen extracted by Valais
	T4	?	Long bone (Humerus)	BE-17879.2.1	5654 ± 25	4546-4371	3.14	44.7	-	subsequent ultrafiltration
	T11	(Ind. 1)	Long bone (Humerus)	BE-17880.1.1	5588 ± 25	4486-4354	3.22	34.4	-	collagen extracted by Valais
	T13	(Ind. 1)	Long bone (Humerus)	BE-17881	-	-	-	-	-	no collagen
Sion, Montorge	T3	Ind. A	Long bone (Humerus)	BE-17886	-	-	-	-	-	no collagen
	T3	Ind. B	Long bone (Humerus)	BE-17887	-	-	-		-	no collagen
	T3	Ind. C	Long bone (Humerus)	BE-17888.1.1	5289 ± 24	4235-3999	3.22	42.4	-	collagen extracted by Valais
Sion, En-Corbassière	(1)	Ind. 1	Long bone (Humerus)	BE-17882.1.1	4340 ± 24	3016-2900	3.21	39.4	-	collagen extracted by Valais
	(1)	Ind. 1	Long bone (Humerus)	BE-17882.2.1	4357 ± 39	3092-2897	3.28	43.5	-	subsequent ultrafiltration
	(1)	Ind. 2	Long bone (Humerus)	BE-17883	-	-	-	-	-	no collagen
	(1)	Ind. 3	Long bone (Humerus)	BE-17884	-	-	-	-	-	no collagen
	(1)	Ind. 4	Long bone (Humerus)	BE-17885.1.1	-	-	3.34*	30.0	-	C/N too high
Thonon-les-Bains, Genevray	T84	Ind. 1	Long bone (Femur)	BE-17775.1.1	-	-	3.24	44.7	0.35*	gelatin yield too low
	T84	Ind. 2	Long bone (Femur)	BE-17776.1.1	5738 ± 25	4680-4501	3.24	44.1	1.73	
	T84	Ind. 4	Long bone (Femur)	BE-17777.1.1	5727 ± 25	4678-4464	3.23	44.3	0.94	
	T69	Ind. A	Long bone (Femur)	BE-17778.1.1	5633 ± 25	4537-4367	3.22	42.3	2.47	
	T69	Ind. C	Long bone (Femur)	BE-17779.1.1	5762 ± 25	4696-4541	3.21	43.7	0.90	
	T69	Ind. D	Long bone (Femur)	BE-17780.1.1	5776 ± 25	4704-4547	3.23	44.3	1.14	
	T85	Adult	Long bone (Humerus)	BE-17781.1.1	-	-	3.36*	42.1	0.27*	gelatin yield too low, C/N too high

Table 2 continued.

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Comment
Thonon-les-Bains, Genevray	T85	Subadult	Long bone (Humerus)	BE-17782	-	-	-	-	-	no collagen
	T86	Adult	Long bone (Femur)	BE-17783.1.1	5717 ± 25	4673-4459	3.23	44.3	0.85	
	T86	Subadult	Long bone (Femur)	BE-17784.1.1	5640 ± 25	4540-4369	3.23	44.8	1.43	
	T55	Adult	Long bone (Femur)	BE-17785.1.1	3809 ± 23	2341-2144	3.21	44.2	1.21	
	T55	Subadult	Long bone (Radius)	BE-17786.1.1	3834 ± 23	2451-2155	3.21	45.2	3.45	
	T106	Male	Long bone (Femur)	BE-17787.1.1	5438 ± 25	4345-4249	3.25	43.9	0.49	
	T106	Female	Long bone (Femur)	BE-17788.1.1	-	-	3.37*	42.8	0.32*	gelatin yield too low,
	T757	Ind. 1	Long bone (Femur?)	BE-17789.1.1	5853 ± 26	4795-4616	3.28	44.8	1.94	
	T1107	Ind. 1	Long bone (Humerus)	BE-17790.1.1	5999 ± 25	4986-4797	3.22	44.9	1.95	
	T143	Adult	Long bone (Femur)	BE-17791.1.1	4719 ± 24	3626-3377	3.24	44.5	1.87	
	T143	Subadult	Long bone (Femur)	BE-17792.1.1	4660 ± 24	3516-3368	3.21	45.1	2.02	
	T1005	Ind. 3	Long bone (Tibia)	BE-17794.1.1	5749 ± 25	4686-4504	3.24	45.2	0.56	
	T1005	Ind. 5	Long bone (Tibia)	BE-17795.1.1	5749 ± 25	4686-4504	3.20	45.8	2.27	
	T1005	Ind. 6	Long bone (Femur)	BE-17793.1.1	5642 ± 25	4541-4370	3.21	45.9	2.60	
Corseaux-sur-Vevey, En-Seytion	T3-1965	R3	Long bone (Femur)	BE-15233.1.1	5480 ± 35	4442-4250	3.29	44.5	0.5	
	T3-1965	R3a	Long bone (Tibia)	BE-15234.1.1	-	-	3.33	44.4	0.3*	gelatin yield too low
	T1-1973	Sq13	Long bone (Femur)	BE-15235.1.1	5524 ± 29	4446-4333	3.23	44.8	0.7	
	T1-1973	Sq14	Long bone (Femur)	BE-15236.1.1	5415 ± 30	4343-4173	3.19	45.3	2.0	
	T2-1973	Sq16	Long bone (Femur)	BE-15237.1.1	-	-	3.27	37.7	0.15*	gelatin yield too low
	T2-1973	Sq17	Long bone (Femur)	BE-15238.1.1	-	-	3.24	43.6	0.36*	gelatin yield too low
	T3-1973	VRAC1	Long bone (Femur)	BE-15239.1.1	5474 ± 29	4436-4253	3.23	44.5	1.2	
	T3-1973	VRAC2	Long bone (Femur)	BE-15240.1.1	5486 ± 28	4441-4256	3.23	45.3	1.9	
	T3-1973	VRAC3	Long bone (Femur)	BE-15241.1.1	5507 ± 31	4445-4266	3.23	45.0	1.3	
	T4-1973	Sq24	Long bone (Tibia)	BE-15242.1.1	5546 ± 29	4446-4344	3.30	45.0	0.6	
	T4-1973	Sq25	Long bone (Femur)	BE-15243.1.1	5615 ± 29	4532-4358	3.28	43.8	0.7	
	T9-1973	Sq31	Long bone (Femur)	BE-15244.1.1	5524 ± 36	4449-4329	3.29	45.2	0.6	
	T9-1973	Sq32	Long bone (Femur)	BE-15245.1.1	5589 ± 31	4491-4351	3.27	45.0	0.9	
	T15-1976	VRAC1	Long bone (Femur)	BE-15246.1.1	5500 ± 30	4444-4262	3.24	44.7	0.9	
	T15-1976	VRAC2	Long bone (Femur)	BE-15247.1.1	5612 ± 29	4531-4357	3.19	45.4	1.3	
	T15-1976	VRAC3	Long bone (Femur)	BE-15248.1.1	5540 ± 32	4446-4341	3.27	44.8	0.8	

Table 2 continued.

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code	Radiocarbon age (BP ± 1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Comment
Corseaux-sur-Vevey, En-Seytion	T20-1976	Sq46	Long bone (Femur)	BE-15249.1.1	5511 ± 30	4445-4269	3.23	44.3	0.6	
	T20-1976	Sq47	Long bone (Femur)	BE-15250.1.1	5601 ± 30	4495-4355	3.26	43.4	1.5	
Lenzburg, Goffersberg	SKG 1	Ind. I	Long bone (Femur)	BE-14309.1.1	5308 ± 28	4243-4047	3.21	42.9	0.6	
	SKG 1	Ind. II	Long bone (Femur)	BE-14310.1.1	5520 ± 28	4446-4331	3.26	44.1	0.5	
	SKG 1	Ind. III	Long bone (Femur)	BE-14311.1.1	5458 ± 28	4355-4251	3.24	44.1	1.2	
	SKG 5	Ind. II	Long bone (Femur)	BE-14312.1.1	5407 ± 28	4341-4171	3.22	43.7	1.1	
	SKG 5	Ind. I/II	Temporal bone (petrous portion)	BE-13207	-	-	-	-	<0.1*	gelatin yield too low
	SKG 10	Ind. II	Long bone (Femur)	BE-15230.1.1	-	-	-	-	-	no collagen
	SKG 10	Ind. III	Long bone (Femur)	BE-15231.1.1	5398 ± 41	4344-4060	3.21	44.0	0.7	
	SKG 10	Ind. IV	Temporal bone (petrous portion)	BE-13205	-	-	-	-	0.2*	gelatin yield too low
	SKG 10	Ind. V	Temporal bone (petrous portion)	BE-13206	-	-	-	-	<0.1*	gelatin yield too low
	SKG 11	Ind. II	Long bone (Femur)	BE-14313.1.1	5324 ± 28	4249-4050	3.22	42.6	1.4	
	SKG 11	Ind. III (?)	Long bone (Femur)	BE-14314.1.1	-	-	3.28	42.6	0.3*	gelatin yield too low
	SKG 11	(317)	Long bone (Femur)	BE-14315.1.1	-	-	3.29	39.7	0.1*	gelatin yield too low
	SKG 11	(339)	Long bone (Femur)	BE-14316.1.1	5420 ± 28	4342-4178	3.21	42.3	1.0	
	SKG 13	(115)	Long bone (Femur)	BE-15231.1.1	5512 ± 34	4446-4268	3.30	44.0	0.8	
	SKG 14	Ind. I	Long bone (Femur)	BE-14317.1.1	-	-	3.32	40.0	0.3*	gelatin yield too low
	SKG 14	Ind. II	Long bone (Femur)	BE-14318.1.1	5573 ± 28	4452-4351	3.23	44.5	4.4	
	SKG 16	Ind. II	Long bone (Femur)	BE-14319.1.1	-	-	3.35*	43.8	1.1	high C:N-ratio
	SKG 17	Ind. VI	Long bone (Femur)	BE-14320.1.1	5335 ± 28	4317-4052	3.21	40.5	0.6	
	SKG 17	(11)	Long bone (Femur)	BE-14321.1.1	5315 ± 28	4244-4049	3.19	43.8	2.5	
	SKG 17	(104)	Long bone (Femur)	BE-14322.1.1	5400 ± 28	4339-4078	3.21	44.0	3.2	
	SKG 17	(548)	Long bone (Femur)	BE-14323.1.1	5337 ± 28	4318-4052	3.22	44.0	2.7	
Wettingen, Schartenstrasse	(1)	(Ind. 1)	Occipital bone	BE-13209	-	-	3.17	6.8	0.2*	gelatin yield too low
Chiomonte, La-Maddalena	T2	(Ind. 1)	Temporal bone (petrous portion)	BE-17000.1.1	-	-	-	-	<0.1	no collagen
	T3	(Ind. 1)	Temporal bone (petrous portion)	BE-17001.1.1	-	-	-	-	<0.1	no collagen
	T8	(Ind. 1)	Temporal bone (petrous portion)	BE-17002.1.1	-	-	-	-	<0.1	no collagen
	T9	(Ind. 1)	Temporal bone (petrous portion)	BE-17003.1.1	-	-	-	-	<0.1	no collagen
	T20/11	?	Temporal bone (petrous portion)	BE-17004.1.1	-	-	3.46*	34.9	0.32*	gelatin yield too low, C/N too high

Table 2 continued.

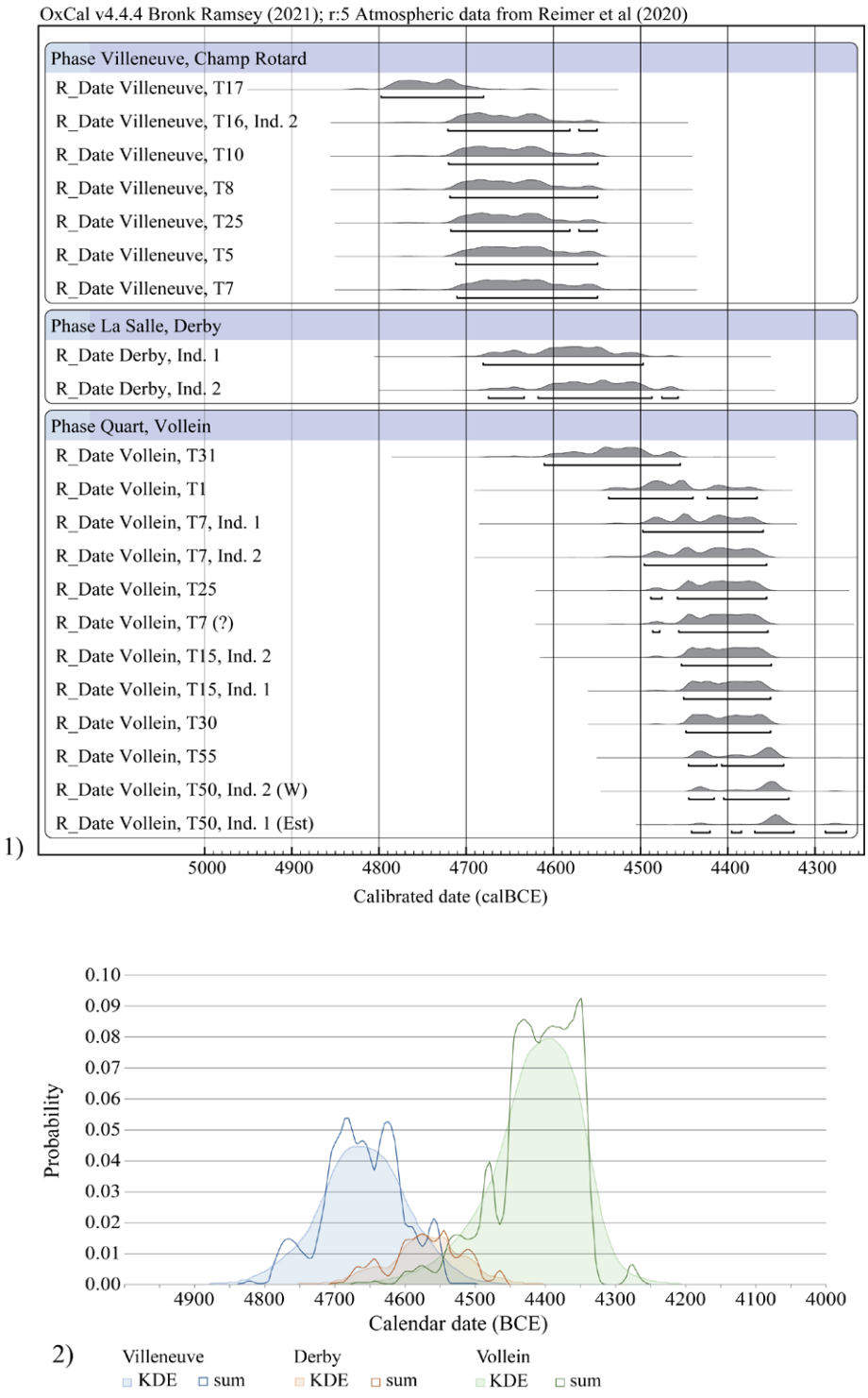

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Villeneuve, Champ Rotard
R_Date Villeneuve, T17
R_Date Villeneuve, T16, Ind. 2
R_Date Villeneuve, T10
R_Date Villeneuve, T8
R_Date Villeneuve, T25
R_Date Villeneuve, T5
R_Date Villeneuve, T7
Phase La Salle, Derby
R_Date Derby, Ind. 1
R_Date Derby, Ind. 2
Phase Quart, Vollein
R_Date Vollein, T31
R_Date Vollein, T1
R_Date Vollein, T7, Ind. 1
R_Date Vollein, T7, Ind. 2
R_Date Vollein, T25
R_Date Vollein, T7 (?)
R_Date Vollein, T15, Ind. 2
R_Date Vollein, T15, Ind. 1
R_Date Vollein, T30
R_Date Vollein, T55
R_Date Vollein, T50, Ind. 2 (W)
R_Date Vollein, T50, Ind. 1 (Est)
1)
5000 4900 4800 4700 4600 4500 4400 4300
Calibrated date (calBCE)
Probability
0.10 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0.00
4900 4800 4700 4600 4500 4400 4300 4200 4100 4000
Calendar date (BCE)
2)
Villeneuve KDE sum
Derby KDE sum
Vollein KDE sum

Figure 145: Calendar ages of the new valid 14C dates from the Aosta Valley (n = 21) displayed as 1) multiplot and 2) overlapping sum and KDE plots using Oxcal 4.4.4 software (source: Steuri et al. 2023).

Upper Rhône Valley

Of the 31 samples obtained from the five sites in the Upper Rhône Valley, LARA was able to generate 19 valid radiocarbon results. In addition, the remaining extracted collagen of ten of these 19 valid samples was dissolved, ultrafiltration was performed, and the collagen was successfully dated again. For this control group, no age difference should be noticeable. Indeed, the ^{14}C measurements without and with subsequent ultrafiltration were, on average, practically identical. The radiocarbon dates for the bone samples originating from the Upper Rhône Valley are listed below (Fig. 146):

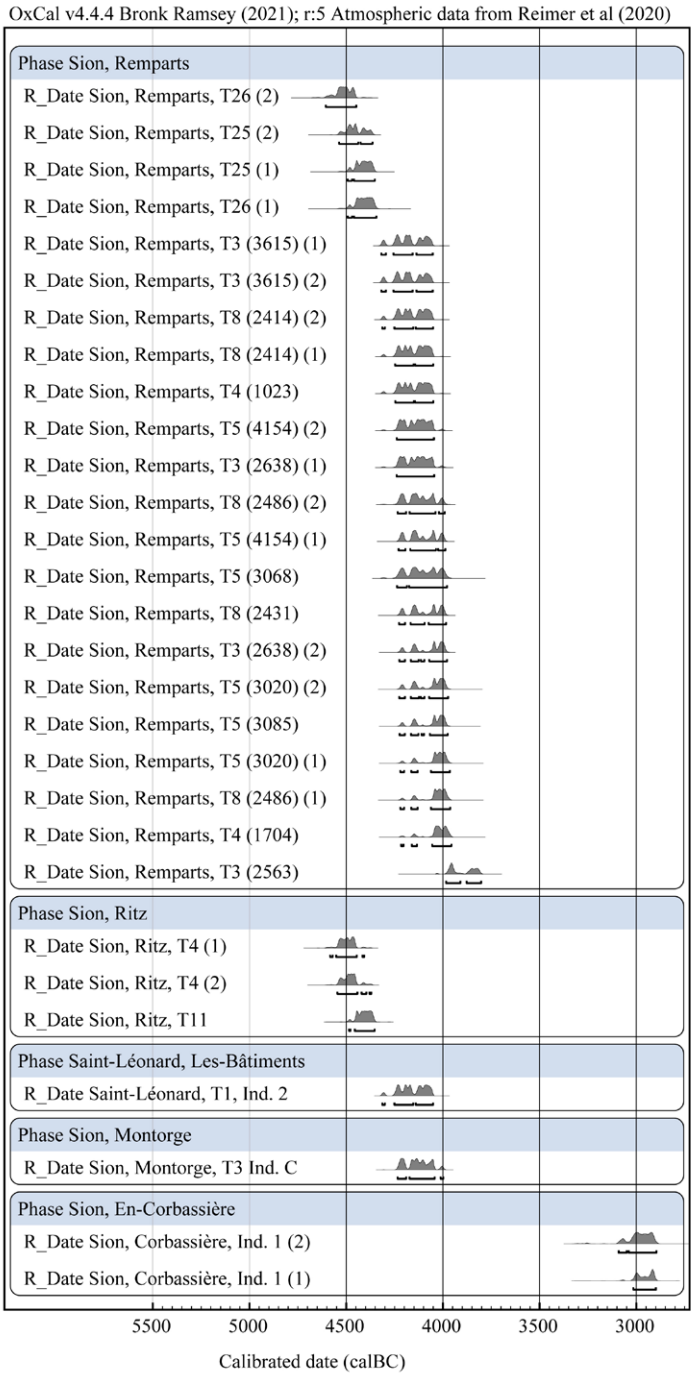

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Sion, Remparts
R_Date Sion, Remparts, T26 (2)
R_Date Sion, Remparts, T25 (2)
R_Date Sion, Remparts, T25 (1)
R_Date Sion, Remparts, T26 (1)
R_Date Sion, Remparts, T3 (3615) (1)
R_Date Sion, Remparts, T3 (3615) (2)
R_Date Sion, Remparts, T8 (2414) (2)
R_Date Sion, Remparts, T8 (2414) (1)
R_Date Sion, Remparts, T4 (1023)
R_Date Sion, Remparts, T5 (4154) (2)
R_Date Sion, Remparts, T3 (2638) (1)
R_Date Sion, Remparts, T8 (2486) (2)
R_Date Sion, Remparts, T5 (4154) (1)
R_Date Sion, Remparts, T5 (3068)
R_Date Sion, Remparts, T8 (2431)
R_Date Sion, Remparts, T3 (2638) (2)
R_Date Sion, Remparts, T5 (3020) (2)
R_Date Sion, Remparts, T5 (3085)
R_Date Sion, Remparts, T5 (3020) (1)
R_Date Sion, Remparts, T8 (2486) (1)
R_Date Sion, Remparts, T4 (1704)
R_Date Sion, Remparts, T3 (2563)
Phase Sion, Ritz
R_Date Sion, Ritz, T4 (1)
R_Date Sion, Ritz, T4 (2)
R_Date Sion, Ritz, T11
Phase Saint-Léonard, Les-Bâtiments
R_Date Saint-Léonard, T1, Ind. 2
Phase Sion, Montorge
R_Date Sion, Montorge, T3 Ind. C
Phase Sion, En-Corbassière
R_Date Sion, Corbassière, Ind. 1 (2)
R_Date Sion, Corbassière, Ind. 1 (1)
5500
5000
4500
4000
3500
3000
Calibrated date (calBC)

Figure 146: Calendar ages of the new valid 14C dates from the Upper Rhône Valley (n = 29) displayed as a multiplot using Oxcal 4.4.4. software.

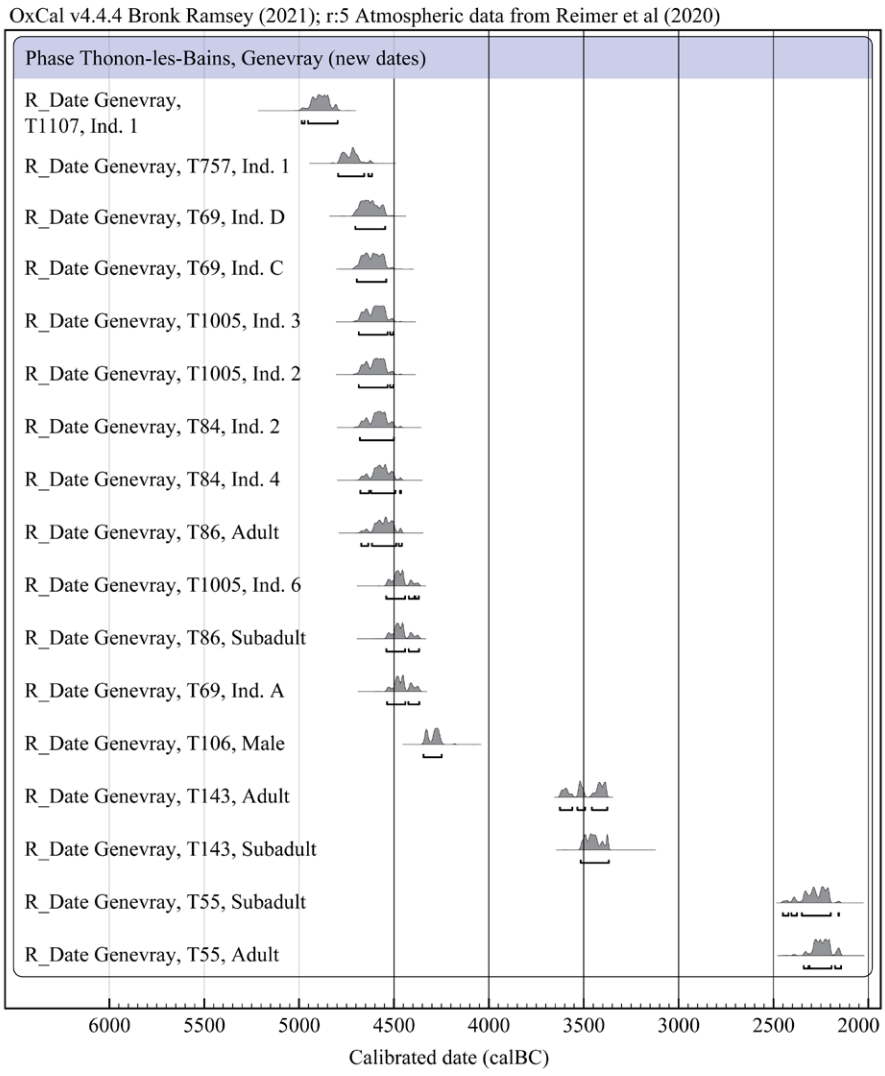

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Thonon-les-Bains, Genevray (new dates)
R_Date Genevray, T1107, Ind. 1
R_Date Genevray, T757, Ind. 1
R_Date Genevray, T69, Ind. D
R_Date Genevray, T69, Ind. C
R_Date Genevray, T1005, Ind. 3
R_Date Genevray, T1005, Ind. 2
R_Date Genevray, T84, Ind. 2
R_Date Genevray, T84, Ind. 4
R_Date Genevray, T86, Adult
R_Date Genevray, T1005, Ind. 6
R_Date Genevray, T86, Subadult
R_Date Genevray, T69, Ind. A
R_Date Genevray, T106, Male
R_Date Genevray, T143, Adult
R_Date Genevray, T143, Subadult
R_Date Genevray, T55, Subadult
R_Date Genevray, T55, Adult
6000 5500 5000 4500 4000 3500 3000 2500 2000
Calibrated date (calBC)

Figure 147: Calendar ages of the new valid 14C dates from Thonon-les-Bains, Genevray (n = 17) displayed as a multiplot using Oxcal 4.4.4. software.

- Saint-Léonard, Les-Bâtiments: Only one valid result is available from the six samples received, dating to 4314–4052 cal. BCE. The others did not meet the quality control criteria or did not have enough collagen.
- Sion, Place et Rue des Remparts: A valid result could be generated for 14 out of the 15 received samples. In addition, the collagen of eight valid samples was redated with subsequent ultrafiltration. At least one additional valid radiocarbon date is available for 35% (n = 12) of the 34 individuals identified across the four collective stone cist graves of this site. These results date the use of the collective graves to the period between 4300/4250 and 3950 BCE, with the exception of one slightly younger radiocarbon date of T3 (bone number 2563) dating to 3984–3803 cal. BCE. The collagen of six samples was additionally redated with subsequent ultrafiltration and the results show no deviation. The two samples from the stone cist graves of a single burial (T25 and T26) produced an older age range of 4600/4550–4350 BCE. Both collagen samples were redated with subsequent ultrafiltration, and the result for grave T26 showed a minor deviation of 4493–4345 cal. BCE (without ultrafiltration) and 4606–4449 cal. BCE (with ultrafiltration).
- Sion, Avenue Ritz: A valid result was produced for two of the three samples. In addition, one sample was redated with subsequent ultrafiltration. These three results date between 4600/4550 and 4350 BCE.

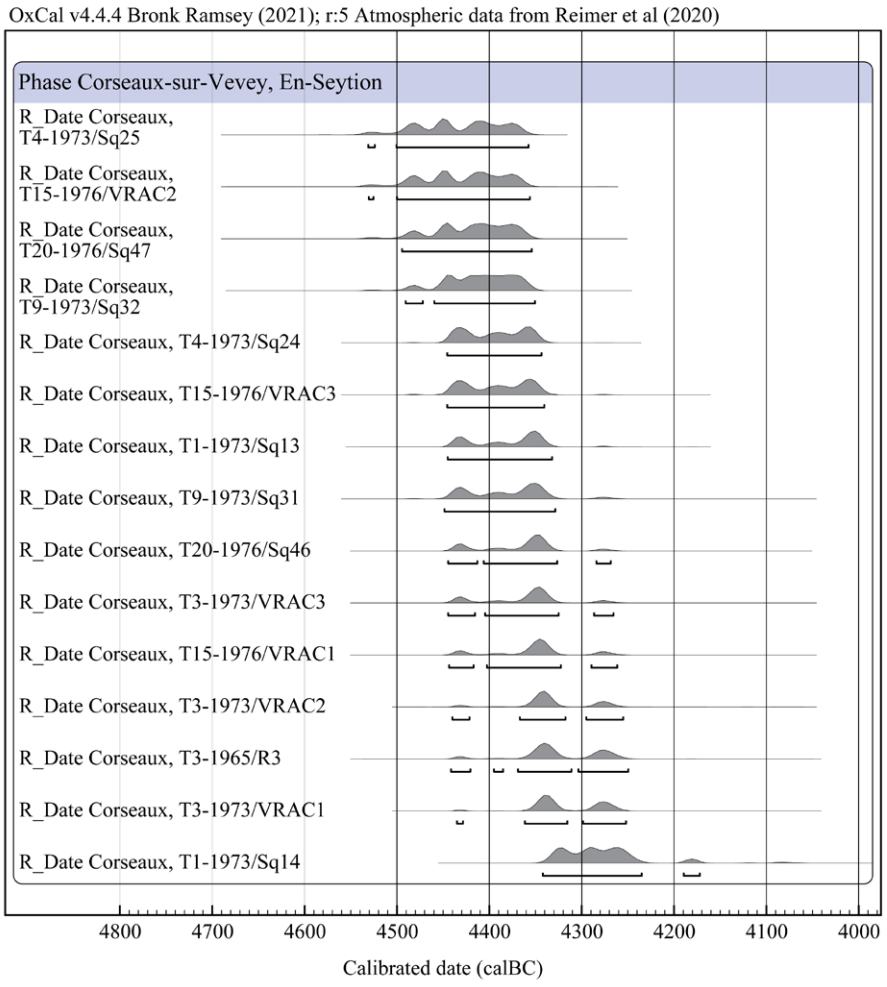


Figure 148: Calendar ages of the new valid 14C dates from Corseaux-sur-Vevey, En-Seytion (n = 15) displayed as a multiplot using Oxcal 4.4.4. software.

- Sion, Montorge: Only one of the three samples produced a valid result, dating between 4235 and 3999 cal. BCE.
- Sion, En-Corbassière: Of the four samples received, only the one from Ind. 1 yielded a valid radiocarbon date, while the others did not meet the quality control criteria or did not have enough collagen. The collagen from Ind. 1 was redated with subsequent ultrafiltration, and both results date to the Late Neolithic period of 3100–2900 BCE.

Lake Geneva South

For 80% (n = 17) of the 21 additional bone samples from the necropolis of Thonon-les-Bains, Genevray, LARA generated a valid radiocarbon date (Fig. 147). Four samples did not meet the quality control criteria or did not have enough collagen.

Regarding the redating of graves with previously available dates older than 4650 BCE, only the two samples from T757 and T1107 produced valid results. These confirm their age, dating to 4795–4616 cal. BCE (T757) and even 4986–4797 cal. BCE (T1107). Additionally, the redating of graves with dates that were previously dated as younger than 4000 BCE predominantly confirm the use of stone cist graves in the 4th and 3rd millennium BCE; two additional radiocarbon dates from grave T143 situate these two individuals to 3625–3375 BCE, and two other samples from T55 date between 2450 and 2150 BCE. The previous radiocarbon date of individual US707 from grave T107 was peculiar, dating to 153 cal. BCE–203 cal. CE. Based on the redate of the same individual (4345–4249 cal. BCE), this old result should be disregarded.

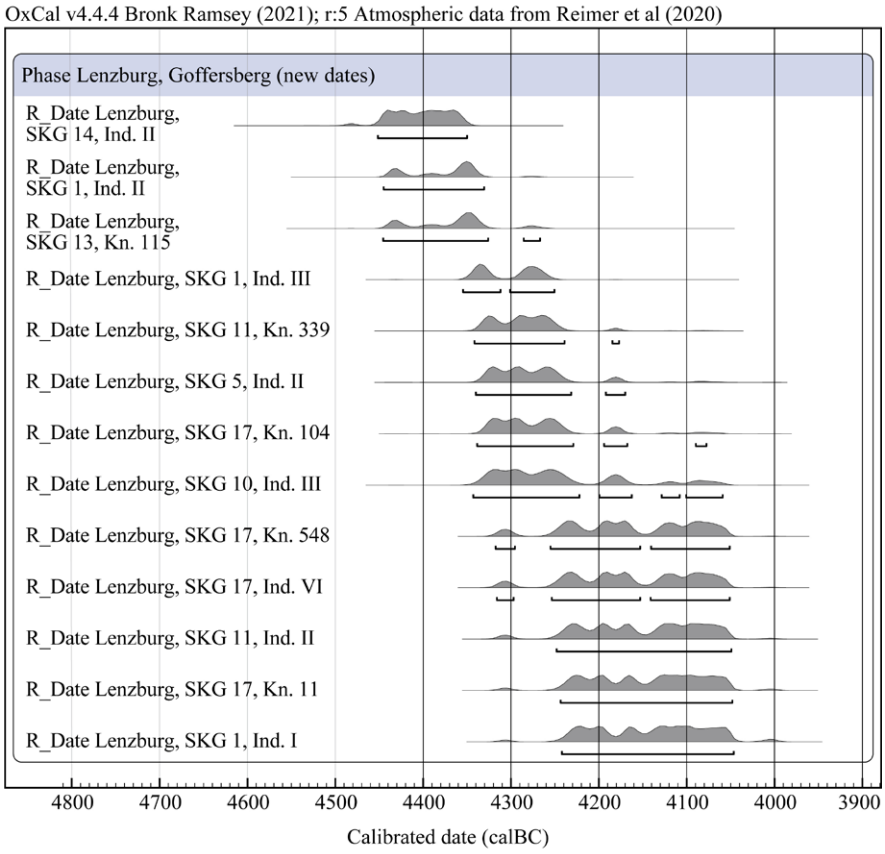

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Lenzburg, Goffersberg (new dates)
R_Date Lenzburg, SKG 14, Ind. II
R_Date Lenzburg, SKG 1, Ind. II
R_Date Lenzburg, SKG 13, Kn. 115
R_Date Lenzburg, SKG 1, Ind. III
R_Date Lenzburg, SKG 11, Kn. 339
R_Date Lenzburg, SKG 5, Ind. II
R_Date Lenzburg, SKG 17, Kn. 104
R_Date Lenzburg, SKG 10, Ind. III
R_Date Lenzburg, SKG 17, Kn. 548
R_Date Lenzburg, SKG 17, Ind. VI
R_Date Lenzburg, SKG 11, Ind. II
R_Date Lenzburg, SKG 17, Kn. 11
R_Date Lenzburg, SKG 1, Ind. I
4800 4700 4600 4500 4400 4300 4200 4100 4000 3900
Calibrated date (calBC)

Figure 149: Calendar ages of the new valid 14C dates from Lenzburg, Goffersberg (n = 13) displayed as a multiplot using Oxcal 4.4.4. software.

Regarding the second aim of these additional radiocarbon dates, assessing the usage period(s) of the collective graves, similar results were identified within graves T69, T84, and T1005; three of the five individuals from grave T69 were sampled and Ind. C and Ind. D show an almost identical radiocarbon age between 4700 and 4550 BCE, while Ind. A is younger (4537–4367 cal. BCE). Regarding grave T86, radiocarbon dates are now available for three of the four individuals, implying up to three usage phases between 4675 and 4175 BCE. Three of the nine individuals of the collective stone cist grave T1005 were dated. Ind. 3 and 5 were dated into the period between 4700 and 4500 BCE, while Ind. 6 (4541–4370 cal. BCE) appears to be from a younger usage period. Finally, the two additional radiocarbon dates from the collective grave T84 confirm the period of use to have been between 4700 and 4450 BCE.

Lake Geneva North

The ^{14}C laboratory of the University of Bern (LARA) was able to generate 15 valid radiocarbon dates for the 18 extracted bone samples from Corseaux-sur-Vevey, En-Seytion (Fig. 148). A modern age determination is available for nearly one-third of all individuals on this site (31.3%). They date between 4500 and 4250 BCE, with only individual Sq. 14 from grave T1-1973 producing a slightly younger age (4343–4173 cal. BCE). The oldest and youngest raw date is separated by 200 years, and the uncertainty ranges average ± 30.5 years. For a total of six collective graves, at least two valid radiocarbon dates are available. Their calibrated age spans are mostly congruent, with the exception of grave T1-1973 for which two usage phases are suspected. The redating of individual Sq. 24 from tomb T4-1973 resulted in an almost 750 years older raw date, confirming the assumption of a too-young-age determination of the sample B 4817. Thus, this previous radiocarbon date of Sq. 24 should be regarded as inaccurate and discarded. This new series of radiocarbon dates provides evidence that the necropolis of Corseaux is at least 500 years older than previously assumed.

Swiss Plateau

Based on the invalid stable isotope analysis of the three petrous bone samples (Siebke, 2019, 106), bad collagen preservation was suspected for the samples from the necropolis of Lenzburg, Goffersberg. LARA was able to produce a valid result for 62% (n = 13) of the 21 analysed bone samples (Fig. 149). These originate from seven graves; therefore, at least one additional valid radiocarbon date is available for almost half of the 16 stone cist graves.

Regarding the aim of assessing the usage period(s) of the collective graves, the results from two stone cists are staggering: a valid radiocarbon date is available for three of the five individuals from grave SKG 1. These results indicate different usage periods of 4446–4331 cal. BCE (Ind. II), 4355–4251 cal. BCE (Ind. III), and 4243–4047 cal. BCE (Ind. I). Four valid radiocarbon dates are available for grave SKG 17. These results are more uniform and date to the period of 4325–4050 BCE. The remaining six valid radiocarbon dates come from five stone cists and do not deviate from these covered usage periods dating between 4450 and 4050 BCE.

The analysed sample from Wettingen, Schartenstrasse, did not meet the quality control criteria for valid radiocarbon dating.

Peripheral sites

No valid results are available, as none of the five bone samples from the site of Chiomonte, La-Maddalena, met the quality control criteria or had enough collagen.

Burial practices within Western Alpine cist graves

6

In the following section, the features of the assessed sites (from Chapter 4) are listed with a specific focus on detectable burial practices within the defined geographical zones. It is divided into two subsections. The first (Chapter 6.1) covers the spatial organisation of the graves and necropolis, since the aspects of used grave architecture, accessibility, or size of grave sites are related to, or influenced by, the performed rituals. The second subsection (Chapter 6.2) will focus on the treatment of the human remains within the sites, specifically on the average minimum number of individuals (MNI), the ratio of multiple burials (containing the remains of at least three individuals), and the ratio of unmanipulated primary burials (as far as the data indicate).

The available data regarding grave architecture, sex, age at death, and burial practice or placement for the assessed graves are compiled in Table 3. Table 4 lists these aspects, summarised by the respective sites.

6.1. Spatial organisation of grave sites

All sites discovered in the Aosta Valley, including the isolated stone cists, were placed on plateaus or river terraces. The two larger necropolises consist of closely grouped stone cists with a relatively high number of graves; estimates range from around 50 graves for the site of Villeneuve to over 80 for Vollein. They are of smaller size, with an average size of only 0.4 m^2. The rectangular stone cists were generally formed of four lateral slabs and a horizontal capstone. The fitted stones are made from relatively thin local slate. In contrast, the grave group from Montjovet exhibited a less regular build, with up to six lateral slabs and multiple capstones. In addition, there is no clear evidence for the use of wooden cists or pit graves within these sites. The available data for the necropolis of Vollein are limited, and stone cists can only be visually confirmed for about 70% of the recorded graves. It is currently impossible to assess whether the remaining 30% consisted of simple pits or wooden cists, or if the lateral slabs were removed at some point. In addition, the site of Vollein exhibited some unique features in the north of the necropolis, such as the cluster of stacked stone fragments forming a wall, or rock engravings.

Regarding the layout of the sites located in the Tarentaise Valley, the five excavated stone cists from Aime indicate very similar construction, with four fitted lateral slabs and an oversized capstone. The latter was presumably above the Neolithic surface level and therefore accessible. It had been suggested that the whole necropolis could consist of over 30 regularly arranged graves. The limited available data from the site of Bourg-Saint-Maurice indicate a grave group located on a plateau. Next to five disturbed, smaller stone cists, a cluster of bones indicates an additional pit grave.

Regarding the sites located in the Upper Rhône Valley, it had been suggested that the capstones of the three larger stone cists found in Saint-Léonard were below the Neolithic surface level, and the location of the graves was probably marked with an elongated

Site	Grave	Grave Architecture			Sex				Age Class		
		Size (m2)	Stone slabs	Direction (Degree)	MNI	male	female	un-known sex	neonat	infans	juvenil
Villeneuve, Champ Rotard	T4	0.38	NA	NA	1	1	0	0	0	0	0
	T5	0.47	NA	NA	1	0	1	0	0	0	0
	T6	0.36	4	290	1	0	1	0	0	0	0
	T7	0.30	4	270	1	0	1	0	0	0	0
	T8	0.48	NA	265	1	0	1	0	0	0	0
	T9	0.26	4	240	1	0	0	1	0	1	0
	T10	0.58	4	250	1	1	0	0	0	0	0
	T11	0.43	NA	270	1	1	0	0	0	0	0
	T12	0.15	4	NA	1	0	0	1	0	1	0
	T14	0.36	6	270	1	1	0	0	0	0	0
	T16	0.32	NA	NA	2	0	1	0	0	1	0
	T17	0.40	5	255	1	0	1	0	0	0	0
	T18	0.47	5	290	1	1	0	0	0	0	0
	T19	0.55	NA	NA	1	0	0	1	0	0	0
	T20	0.26	4	NA	1	0	0	1	1	0	0
	T21	0.24	4	NA	1	0	1	0	0	0	0
	T22	0.43	5	290	1	0	1	0	0	0	0
	T23	0.74	5	NA	1	1	0	0	0	0	0
	T24	0.26	NA	265	1	0	0	1	0	1	0
	T25	0.6	4	270	1	1	0	0	0	0	0
Montjovet, Fiusey	Sep. I	0.66	6	360	1	0	0	1	0	0	0
	Sep. II	0.36	6	NA	1	0	1	0	0	0	0
	Sep. III	0.43	NA	NA	1	0	0	1	0	0	0
	Sep. IV	0.53	NA	NA	2	0	0	2	0	0	0
	Sep. V	0.88	NA	NA	3	0	0	3	0	0	0
La Salle, Derby	(T1)	NA	4	NA	3	1	1	1	0	1	0
Aime, Le Replat	T1	0.81	4	95	1	0	0	0	0	0	0
	T3	0.75	4	90	1	0	0	1	0	0	0
	T5	0.83	4	90	4	0	1	3	0	0	1
	T6	0.60	4	100	4	0	0	4	0	1	0
Bourg-Saint-Maurice, Le Châtelard	II-1	0.33	NA	55	1	0	0	1	0	1	0
	II-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	II-3	0.36	NA	250	NA	NA	NA	NA	NA	NA	NA
	II-4	0.23	NA	45	1	0	0	1	0	1	0
	T1	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	T2	0.29	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Léonard, Les-Bâtiments	T1	0.96	4	35	4	3	1	0	0	0	1
	T2	0.69	4	10	3	1	1	1	0	1	0
	T3	1.26	4	10	4	1	1	2	0	0	2
Sion, Sous-le-Scex	T3	0.48	0	90	1	1	0	0	0	0	0
	T4	0.69	6	5	4	0	0	4	0	0	0
	T5	0.38	5	345	1	0	0	1	0	1	0
	T6	0.47	0	120	1	0	1	0	0	0	0

Table 3: Compiled data of the assessed graves (n = 214).

Age Class			Burial Practice					Burial Placement				
adult	matur	unknown age	primary	primary-displaced	secondary (reduction)	cremation	unclear ritual	Left side	Right side	Dorsal	unclear position	Hyper flex
1	0	0	0	0	0	0	1	0	0	0	1	NA
0	1	0	0	0	0	0	1	0	0	1	0	NA
0	1	0	1	0	0	0	0	1	0	0	0	1
0	1	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	0	0	1	0	0
0	0	0	1	0	0	0	0	1	0	0	0	NA
1	0	0	1	0	0	0	0	0	0	1	0	0
1	0	0	1	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	1	0	0	0	1	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	2	0	0	0	2	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	1	0	0	0	0	0	0	1	0
0	0	0	0	1	0	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	1	0	0	1	0	NA
0	0	0	1	0	0	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	0	0	1	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	0	0	1	0	0	0	0	0	1	0
0	0	1	0	0	0	0	1	0	0	0	1	NA
0	0	2	0	0	2	0	0	0	0	0	2	0
0	0	3	0	0	0	0	3	0	0	0	3	NA
2	0	0	0	0	0	0	3	0	0	0	3	NA
0	1	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
2	0	1	2	1	1	0	0	2	0	0	2	0
3	0	0	0	2	2	0	0	0	0	0	4	0
0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0	3	0	1	3	0	0	0	0	0	0	4	NA
2	0	0	1	2	0	0	0	3	0	0	0	0
2	0	0	0	1	0	3	0	0	0	0	4	NA
1	0	0	0	1	0	0	0	0	0	0	1	NA
4	0	0	2	0	0	0	2	1	0	0	3	1
0	0	0	1	0	0	0	0	0	0	0	1	0
1	0	0	1	0	0	0	0	1	0	0	0	0

Site	Grave	Grave Architecture			Sex				Age Class		
		Size (m2)	Stone slabs	Direction (Degree)	MNI	male	female	un-known sex	neonat	infans	juvenil
Sion, Sous-le-Scex	T7	0.50	NA	345	1	1	0	0	0	0	0
	T8	0.29	0	110	1	0	1	0	0	0	0
	T12	0.49	NA	5	1	0	1	0	0	0	0
	T13	0.40	6	350	1	0	0	1	0	0	1
	T14	0.18	4	340	1	0	0	1	1	0	0
	T16	0.62	4	335	1	0	0	1	0	1	0
	T17	1.26	6	355	1	0	1	0	0	0	0
	T19	0.80	6	15	1	0	1	0	0	0	0
	T20	0.53	5	355	1	0	1	0	0	0	0
	T22	0.28	4	40	2	0	0	2	0	2	0
	T23	0.85	6	40	2	0	1	1	1	0	0
	T24	0.36	NA	70	1	0	1	0	0	0	0
Sion, Chemin-des-Collines	T1	0.53	4	69	1	1	0	0	0	0	0
	T2	0.40	4	55	2	0	0	2	0	0	1
	T3	0.13	4	77	1	0	0	1	1	0	0
	T4	0.10	4	64	1	0	0	1	1	0	0
	T5	0.43	5	64	1	0	0	1	0	0	0
	T6	0.42	6	63	1	0	1	0	0	0	0
	T7	0.57	6	42	1	0	1	0	0	0	0
	T8	0.16	4	56	1	0	0	1	0	1	0
	T9	0.43	6	55	1	0	1	0	0	0	0
	T10	0.55	0	76	1	1	0	0	0	0	0
	T11	0.72	0	73	1	1	0	0	0	0	0
	T12	0.25	4	62	1	0	0	1	0	1	0
	T13	0.20	4	33	1	0	0	1	0	1	0
	T14	0.43	4	73	1	0	0	1	0	0	1
	T15	0.35	4	62	1	0	0	1	0	1	0
	T16	0.24	4	70	1	0	0	1	0	1	0
	T17	0.18	4	46	1	0	0	1	1	0	0
	T18	0.47	6	63	1	0	0	1	0	0	0
	T19	0.43	4	64	1	1	0	0	0	0	0
	T20	0.41	4	63	2	0	0	2	0	1	1
	T21	0.21	4	69	1	0	0	1	0	1	0
	T22	0.43	4	54	1	1	0	0	0	0	0
	T23	0.22	4	75	1	0	0	1	0	1	0
	T24	0.44	4	65	1	0	1	0	0	0	0
	T25	0.49	4	73	1	1	0	0	0	0	0
Sion, Avenue-Ritz	T1	0.52	4	0	1	0	0	1	0	0	0
	T3	0.43	NA	31	1	0	1	0	0	0	0
	T4	0.29	NA	34	2	0	0	2	0	2	0
	T5	0.63	NA	42	1	1	0	0	0	0	0
	T6	0.67	4	27	1	1	0	0	0	0	0
	T7	0.43	NA	53	1	0	0	1	0	0	0

Table 3 continued.

Age Class			Burial Practice					Burial Placement				
adult	matur	unknown age	primary	primary-displaced	secondary (reduction)	cremation	unclear ritual	Left side	Right side	Dorsal	unclear position	Hyper flex
0	1	0	1	0	0	0	0	1	0	0	0	0
0	1	0	1	0	0	0	0	0	1	0	0	1
1	0	0	0	1	0	0	0	0	0	0	1	NA
0	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	0	0	0	1	NA
0	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	2	0	0	0	0	1	0	0	0	1
1	0	0	2	0	0	0	0	1	0	0	0	1
1	0	0	1	0	0	0	0	1	0	0	0	1
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	1	1	0	1	0	0	1	0	0	1	0
0	0	0	1	0	0	0	0	1	0	0	0	NA
0	0	0	1	0	0	0	0	1	0	0	0	NA
0	1	0	1	0	0	0	0	1	0	0	0	NA
0	1	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	1	0	0	0	NA
0	1	0	1	0	0	0	0	1	0	0	0	0
0	1	0	1	0	0	0	0	1	0	0	0	1
0	0	0	2	0	0	0	0	1	0	0	1	0
0	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	0	1	0	0	0	1	0	0	0	NA
1	0	0	1	0	0	0	0	1	0	0	0	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	0	0	0	2	0
1	0	0	1	0	0	0	0	0	0	0	0	NA
0	0	0	1	0	1	0	0	0	0	0	1	NA
0	1	0	1	0	0	0	0	0	0	0	1	NA
0	1	0	1	0	0	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	0	0	0	1	NA

Site	Grave	Grave Architecture			Sex				Age Class		
		Size (m2)	Stone slabs	Direction (Degree)	MNI	male	female	un-known sex	neonat	infans	juvenil
Sion, Avenue-Ritz	T8	0.51	4	66	1	0	0	1	0	0	0
	T9	0.31	4	88	1	0	0	1	0	1	0
	T10	0.62	NA	53	1	0	1	0	0	0	0
	T11	0.56	6	52	1	1	0	0	0	0	0
	T12	0.24	4	13	1	0	0	1	0	1	0
	T13	0.66	6	80	1	0	0	1	0	0	0
	T14	0.33	4	22	1	0	0	1	0	0	1
	T15	0.68	6	13	1	0	0	1	0	0	0
Sion, Montorge	T1	0.95	4	345	1	0	0	1	0	1	0
	T2	0.27	4	355	2	0	0	2	0	2	0
	T3	0.33	4	340	3	3	0	0	0	0	0
Thonon-les-Bains, Genevray	T12	0.27	4	65	2	0	0	2	1	1	0
	T14	0.74	5	70	4	0	0	4	0	0	2
	T15	0.40	6	65	1	0	0	1	0	1	0
	T19	0.29	5	30	2	0	0	2	0	0	0
	T22	0.94	4	115	3	0	0	3	0	1	1
	T24	0.50	4	45	3	0	0	3	0	1	0
	T29	0.25	4	80	5	0	0	5	2	3	0
	T31	0.45	4	70	1	0	1	0	0	0	0
	T42	0.48	4	100	4	0	0	4	1	1	0
	T55	0.63	NA	50	2	0	0	2	0	1	0
	T56	0.78	4	105	3	0	0	3	0	0	1
	T64	0.21	5	65	1	0	0	1	0	0	0
	T66	0.45	6	70	1	0	0	1	0	1	0
	T67	0.40	5	70	1	0	0	1	0	1	0
	T68	0.17	4	65	1	0	0	1	0	1	0
	T69	0.55	5	70	5	0	0	5	0	3	1
	T70	0.32	4	85	1	0	0	1	0	0	0
	T71	0.60	4	55	2	0	0	2	0	0	0
	T72	0.74	4	60	2	0	0	2	0	1	0
	T73	0.36	3	40	1	0	0	1	0	0	0
	T74	0.50	4	70	5	0	0	5	0	2	0
	T75	0.64	4	80	1	0	0	1	0	0	1
	T76	0.56	4	55	2	0	0	2	0	1	0
	T77	0.14	4	60	1	0	0	1	0	1	0
	T83	0.39	4	90	2	0	0	2	0	2	0
	T84	0.45	4	55	4	0	0	4	0	4	0
	T85	0.94	4	85	4	0	0	4	0	0	0
	T86	0.55	4	125	4	0	1	3	2	1	0
	T88	0.63	4	45	4	0	0	4	0	1	1
	T89	1.08	5	50	3	0	0	3	0	0	0
	T93	0.94	5	85	4	0	0	4	0	0	0
	T94	0.48	4	90	1	0	0	1	0	0	0
	T95	0.65	4	70	2	0	1	1	1	0	0

Table 3 continued.

Age Class			Burial Practice					Burial Placement				
adult	matur	unknown age	primary	primary-displaced	secondary (reduction)	cremation	unclear ritual	Left side	Right side	Dorsal	unclear position	Hyper flex
0	1	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0
0	1	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	0	0	0	1	1
0	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	2	0	0	0	0	0	0	0	0	2
3	0	0	3	0	0	0	0	0	0	0	3	NA
0	0	0	1	1	0	0	0	0	0	0	2	NA
2	0	0	0	3	1	0	0	0	0	0	4	NA
0	0	0	0	1	0	0	0	0	0	0	1	NA
2	0	0	0	0	0	0	2	0	0	0	2	NA
1	0	0	2	1	0	0	0	1	0	0	2	0
2	0	0	0	2	1	0	0	1	0	0	2	NA
0	0	0	1	0	0	0	4	0	0	0	5	NA
1	0	0	0	1	0	0	0	1	0	0	0	0
2	0	0	0	0	0	0	4	0	0	0	4	NA
1	0	0	1	0	0	0	1	0	1	0	1	NA
2	0	0	0	0	0	0	3	0	0	0	3	NA
0	0	1	0	0	0	0	1	0	0	0	1	NA
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	1	0	0	0		NA
1	0	0	2	2	1	0	0	2	0	1	2	NA
1	0	0	0	0	0	0	1	0	0	0	1	NA
2	0	0	0	0	0	0	2	0	0	0	2	NA
1	0	0	0	2	0	0	0	0	0	0	2	NA
0	0	1	0	0	0	0	1	0	0	0	1	NA
3	0	0	0	0	0	0	5	0	0	0	5	NA
0	0	0	0	0	0	0	1	0	0	0	1	NA
1	0	0	1	1	0	0	0	1	0	0	1	0
0	0	0	0	1	0	0	0	0	0	0	1	NA
0	0	0	1	1	0	0	0	0	1	0	1	0
0	0	0	4	0	0	0	0	2	0	1	1	0
4	0	0	4	0	0	0	0	2	1	1	0	1
1	0	0	3	0	0	0	1	1	0	2	1	2
2	0	0	1	1	0	0	2	0	0	1	3	NA
3	0	0	3	0	0	0	0	3	0	0	0	1
4	0	0	3	0	0	0	1	3	0	0	1	0
0	0	1	0	0	0	0	1	0	0	0	1	0
1	0	0	1	0	0	0	1	0	0	1	1	NA

Site	Grave	Grave Architecture			Sex				Age Class		
		Size (m2)	Stone slabs	Direction (Degree)	MNI	male	female	un-known sex	neonat	infans	juvenil
Thonon-les-Bains, Genevray	T96	0.45	4	80	1	1	0	0	0	0	0
	T97	0.92	5	85	2	1	0	1	0	0	0
	T98	0.19	4	65	1	0	0	1	0	1	0
	T99	0.28	NA	50	1	0	0	1	0	1	0
	T100	0.26	4	35	1	0	0	1	0	1	0
	T101	0.34	4	65	2	0	0	2	0	2	0
	T103	0.21	4	50	1	0	0	1	0	1	0
	T104	0.28	4	90	10	0	0	10	2	7	1
	T105	0.48	4	55	1	0	1	0	0	0	0
	T106	0.85	4	60	2	0	1	1	0	0	0
	T107	0.50	4	60	1	0	0	1	0	1	0
	T142	0.72	4	30	2	0	0	2	1	0	0
	T143	0.63	4	75	4	0	0	4	0	1	1
	T144	0.74	4	70	4	1	2	1	0	0	2
	T151	0.98	5	75	1	1	0	0	0	0	0
	T159	0.68	6	70	5	2	0	3	1	2	0
	T160	0.24	3	95	1	0	0	1	0	0	1
	T165	0.56	4	20	1	0	0	1	0	0	0
	T176	0.66	8	55	1	0	0	1	0	0	0
	T602	0.07	4	60	1	0	0	1	1	0	0
	T757	1.30	0	45	1	0	0	1	0	0	0
	T758	0.62	0	45	1	0	0	1	0	1	0
	T759	0.43	0	45	1	0	0	1	0	0	0
	T760	0.44	0	45	1	0	1	0	0	0	1
	T761	0.78	0	45	2	0	0	2	1	0	1
	T762	0.95	0	45	1	0	0	1	0	0	0
	T767	1.05	0	45	1	0	0	1	0	0	0
	T768	0.47	0	20	1	0	0	1	0	0	0
	T769	0.77	0	70	1	0	0	1	0	0	0
	T773	0.82	0	45	1	0	0	1	0	0	0
	T882	0.32	0	25	1	0	0	1	0	1	0
	T905	0.78	0	45	1	1	0	0	0	0	0
	T926	0.66	0	45	1	0	0	1	0	0	0
	T1004	0.23	5	95	5	0	0	5	0	4	0
	T1005	0.57	4	110	9	1	0	8	2	4	0
	T1044	0.72	0	55	1	0	0	1	0	0	1
Corseaux-sur-Vevey, En-Seytion	1965-T3	0.35	4	45	3	0	1	2	1	1	0
	T1	0.61	NA	80	4	1	2	1	0	0	0
	T2	0.84	4	90	2	1	1	0	0	0	0
	T3	0.60	4	110	6	3	3	0	0	0	0
	T4	0.96	4	90	2	0	1	1	0	1	0
	T5	0.28	4	80	2	0	0	2	0	0	0
	T7	0.43	4	90	3	2	0	1	0	1	0

Table 3 continued.

Age Class			Burial Practice					Burial Placement				
adult	matur	unknown age	primary	primary-displaced	secondary (reduction)	cremation	unclear ritual	Left side	Right side	Dorsal	unclear position	Hyper flex
1	0	0	1	0	0	0	0	1	0	0	0	1
2	0	0	1	0	0	0	1	1	0	0	1	0
0	0	0	0	0	0	0	1	0	0	0	1	NA
0	0	0	0	0	0	0	1	0	0	0	1	NA
0	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	1	1	0	0	0	2	0	0	0	1
0	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	0	4	0	0	6	3	0	1	6	1
1	0	0	1	0	0	0	0	1	0	0	0	0
2	0	0	2	0	0	0	0	1	0	1	0	1
0	0	0	0	1	0	0	0	1	0	0	0	0
1	0	0	1	1	0	0	0	2	0	0	0	0
2	0	0	0	3	0	0	1	1	2	0	1	1
1	1	0	3	1	0	0	0	2	1	1	0	1
1	0	0	1	0	0	0	0	0	0	1	0	0
1	1	0	0	5	0	0	0	2	0	0	3	NA
0	0	0	0	0	0	0	1	0	0	0	1	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0	0	NA
0	0	0	1	0	0	0	0	1	0	0	0	1
1	0	0	1	0	0	0	0	1	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	1	0
1	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	0	0	1	0	0
0	0	0	2	0	0	0	0	0	0	0	2	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	1
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	1
0	0	0	0	0	0	0	1	0	0	0	1	NA
1	0	0	1	0	0	0	0	1	0	0	0	0
1	0	0	1	0	0	0	0	1	0	0	0	1
1	0	0	0	0	5	0	0	0	0	0	5	NA
3	0	0	6	1	0	0	1	5	1	1	2	NA
0	0	0	1	0	0	0	0	0	0	1	0	0
0	1	0	0	0	0	0	3	0	0	0	3	NA
3	0	0	3	0	0	0	1	3	0	0	1	0
0	2	0	2	0	0	0	0	2	0	0	0	0
4	2	0	6	0	0	0	0	6	0	0	0	1
1	0	0	1	1	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	2	0	0	0	2	NA
1	1	0	2	1	0	0	0	2	0	0	1	NA

Site	Grave	Grave Architecture			Sex				Age Class		
		Size (m2)	Stone slabs	Direction (Degree)	MNI	male	female	un-known sex	neonat	infans	juvenil
Corseaux-sur-Vevey, En-Seytion	T9	0.62	4	60	3	1	1	1	1	0	0
	T10	0.68	4	60	2	0	2	0	0	0	0
	T12	0.23	4	40	1	0	0	1	0	0	1
	T15	0.77	NA	60	7	3	3	1	0	0	1
	T16	0.78	4	120	2	0	1	1	1	0	0
	T17	0.08	NA	60	1	0	0	1	1	0	0
	T18	0.14	NA	40	1	0	0	1	1	0	0
	T20	0.76	4	60	4	1	1	2	0	2	0
Lenzburg, Goffersberg	SKG 4	0.90	4	30	6	1	3	2	0	2	1
	SKG 8	0.82	4	50	9	4	1	4	0	2	2
	SKG 9	1.09	4	50	11	4	1	6	0	5	0
	SKG 10	1.21	4	50	5	3	0	2	0	2	1
	SKG 11	1.10	4	70	7	3	1	3	1	2	0
	SKG 12	1.31	4	45	1	1	0	0	0	0	0
	SKG 13	1.05	5	60	17	2	2	13	0	5	2
	SKG 14	0.99	4	70	5	1	2	2	0	2	2
	SKG 17	1.04	4	45	7	3	0	4	1	2	1
Däniken, Studenweid	1/1946	1.11	4	NA	NA	NA	NA	NA	NA	NA	NA
	2/1946	1.04	5	NA	NA	NA	NA	NA	NA	NA	NA
	1/1970	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/1970	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/1970	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wettingen, Scharten-strasse	(1)	0.66	4	NA	1	0	0	1	0	0	0
Chiomonte, La Maddalena	T1	0.82	NA	55	1	0	0	1	0	0	1
	T2	1.28	NA	55	1	0	1	0	0	0	0
	T3	1.28	4	70	1	0	0	1	0	0	0
	T4	1.22	4	50	1	1	0	0	0	0	0
	T6	1.05	4	95	1	0	0	1	0	0	1
	T7	1.24	5	50	1	0	0	1	0	0	0
	T8	0.66	5	95	1	0	1	0	0	0	0
	T9	1.90	5	95	1	0	1	0	0	0	0
Niederried, Ursisbalm	(1)	0.30	4	NA	4	0	1	3	0	2	0
Montagnieu, Grotte-du-Souhait	SG	NA	0	135	1	0	0	1	0	0	0
	Sp1	0.91	0	310	2	0	0	2	0	0	0
	Sp2	0.24	4	15	1	0	0	1	0	1	0
	Sp3	0.18	4	360	1	0	0	1	0	1	0
	Sp4	0.60	0	350	2	0	0	2	0	0	1
	Sp5	0.32	7	10	8	0	0	8	0	3	2
	Sp6	0.48	6	300	3	0	0	3	0	0	0
	Sp7	0.08	7	20	1	0	0	1	0	1	0

Table 3 continued.

Age Class			Burial Practice					Burial Placement				
adult	matur	unknown age	primary	primary-displaced	secondary (reduction)	cremation	unclear ritual	Left side	Right side	Dorsal	unclear position	Hyper flex
1	1	0	3	0	0	0	0	2	0	0	1	1
2	0	0	2	0	0	0	0	2	0	0	0	1
0	0	0	0	0	1	0	0	0	0	0	0	NA
4	2	0	6	1	0	0	0	0	0	0	7	NA
1	0	0	2	0	0	0	0	0	0	1	1	0
0	0	0	0	0	0	0	1	0	0	0	1	NA
0	0	0	0	0	0	0	1	0	0	0	1	NA
2	0	0	4	0	0	0	0	4	0	0	0	NA
3	0	0	6	0	0	0	0	6	0	0	0	0
5	0	0	8	1	0	0	0	6	0	1	1	2
5	1	0	0	3	1	0	7	2	0	0	9	NA
2	0	0	1	3	1	0	0	1	0	0	4	1
3	1	0	3	2	0	2	0	1	0	0	6	NA
1	0	0	1	0	0	0	0	1	0	0	0	1
3	3	0	1	3	12	0	1	1	0	0	16	NA
1	0	0	4	1	0	0	0	2	0	0	3	3
3	0	0	2	1	4	0	0	2	0	0	5	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0	0	0	0	0	0	1	0	0	0	1	NA
0	0	0	0	0	1	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	0	0	0	1	NA
0	0	1	0	0	1	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	0	0	0	1	NA
0	0	0	0	0	1	0	0	0	0	0	1	NA
1	0	0	0	0	1	0	0	0	0	0	1	NA
1	0	0	1	0	0	0	0	1	0	0	0	1
1	0	0	1	0	0	0	0	0	0	0	1	NA
2	0	0	1	0	3	0	0	0	1	0	3	1
1	0	0	1	0	0	0	0	1	0	0	0	1
2	0	0	2	0	0	0	0	2	0	0	0	0
0	0	0	0	1	0	0	0	0	0	0	1	NA
0	0	0	1	0	0	0	0	1	0	0	0	NA
1	0	0	2	0	0	0	0	2	0	0	0	2
3	0	0	2	1	5	0	0	3	0	0	5	NA
3	0	0	3	0	0	0	0	3	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	1

Site	Number of graves	Average grave size	Ratio of stone cists (%)	Orientation (Degrees)	Multiple burials (≥3 Indiv., %)
Quart, Vollein	66	0.43	≥70	S-N/SW-NE	≥1
Villeneuve, Champ Rotard	33	0.39	100	W-E/SW-NE (248)	0
Montjovet, Fiusey	5	0.57	100	NA	1
La Salle, Derby	1	NA	100	NA	100 (n=1)
Aime, Le Replat	5 (30)	0.74	100	E-W (91)	40 (n=2)
Bourg-Saint-Maurice, Le Châtelard	6	0.32	83	NE-SW (SE-NW?)	0
Saint-Léonard, Les-Bâtiments	3	0.97	100	NE-SW/N-S (18)	100 (n=3)
Sion, Place et Rue des Remparts	15 (?)	0.77	80	NE-SW-N-S	26 (n=4)
Sion, Sous-le-Scex	16	0.54	81	N-S/E-W (183)	6 (n=1)
Sion, Chemin-des-Collines	25	0.37	92	NE-SW (63)	0
Sion, Avenue-Ritz	14	0.49	100	NE-SW (41)	0
Sion, Montorge	3 (6)	0.52	100	N-S	17 (n=1)
Thonon-les-Bains, Genevray	69 (>220)	0.56	60	NE-SW (64)	28 (n=19)
Corseaux-sur-Vevey, En-Seytion	>15	0.54	100	E-W (72)	47 (n=7)
Pully, Chamblandes	>71	NA	100	E-W	26
Lausanne, Vidy	>126	NA	41	E-W (NE/SE)	22
Lenzburg, Goffersberg	16	1.06	100	NE-SW (52)	75 (n=12)
Däniken, Studenweid	5	NA	100	E-W/W-E (?)	NA
Wettingen, Schartenstrasse	1	0.66	100	SE-NW	0
Chiomonte, La-Maddalena	10 (11)	1.18	100	E-W/NE-SW (71)	0
Niederried, Ursisbalm	1	0.30	100	NW-SE	0
Montagnieu, Grotte-du-Souhait	8	0.40	63	NE-SW/N-S (99)	25 (n=2)

Table 4: Listing of aspects related to burial practices by assessed sites (n = 22).

stone on the surface. In addition, Neolithic rock carvings are located around 200 m southwest of the graves, and Neolithic settlement layers were found 500 m to the east.

At the site of Sion, Remparts, the collective and single stone cist graves were found next to each other, while the three wooden cists were placed around 20 m to the east. Additionally, this results in a ratio of 80% stone cists for this necropolis. To the northwest and southeast of the graves, presumed Neolithic settlement layers were located. Remarkably, there is an evident difference in the size of the collective stone cists and the graves containing one primary burial (regardless of grave architecture). The average grave sizes generally appear to correlate with the MNI or treatment of human remains within these sites, as the collective stone cists from Sion, Remparts, cover an average of 1.29 m^2, while the single graves average 0.47 m^2.

Similarly, the collective graves from Saint-Léonard measured an average of 0.97 m^2, while the single graves from the three other necropolises assessed in the municipality of Sion (Sous-le-Scex, Chemin-des-Collines, and Avenue Ritz) measured only about half that size. In general, these three sites show a similar layout, consisting almost exclusively of smaller stone cists. Only three pit graves at Sous-le-Scex and two presumed wooden cists at Chemin-des-Collines deviate from this norm. The only collective burial was found at Sous-le-Scex and, strikingly, this grave was also the largest stone cist of this site. Regarding megalithic elements, a row of Neolithic standing stones was found around 80 m northwest of the necropolis of Chemin-des-Collines. It remains unclear if they are contemporaneous to the stone cists.

The extensively researched site of Thonon-les-Bains, Genevray, allows many unique insights regarding the spatial arrangement of this vast necropolis located on a plateau near the southern shore of Lake Geneva. A spatial separation regarding grave architecture is recognisable within the site, with wooden cists concentrated in the western and

Average MNI	Sex Ratio Adults (F=female, M=male)	Subadults (%)	Ratio primary burials (%)	Ratio Graves with grave goods (%)
NA	NA	NA	NA	15 (?)
1.05	10F, 9M	21 (n=5)	87	6
1.6	NA	NA	25	0
3	1F, 1M	33 (n=1)	NA	0
2.4	NA	NA	42	100
NA	NA	NA	NA	0
3.67	4F, 3M	36 (n=4)	18	100
3.06	NA	NA	NA	40
1.31	8F, 2M	33 (n=7)	89	19
1.08	6F, 4M	54 (n=14)	89	32
1.07	2F, 3M	33 (n=5)	93	21
2	0F, 3M (?)	50 (n=3)	100	0
2.23	8F, 8M	55 (n=85)	60	19
2.87	16F, 12 M	28 (n=12)	72	40
NA	NA	NA	NA	NA
1.9	NA	NA	76 (?)	NA
7.56	10F, 22M (*)	52 (n=33)	43	88
NA	NA	NA	NA	100
1	NA	0	NA	100
1	3F, 1M	25 (n=2)	50	30
1	1F (?)	50 (n=2)	100	0
2.38	NA	47 (n=9)	63	67

northern sections and stone cists dominating the southern and eastern sections of the necropolis. The majority of stone cists had probably been visible and accessible on the Neolithic surface. The wooden cists were below ground, and small upright-placed stone slabs and post holes were interpreted as remains of grave markings. The capstones were of varying sizes, from small slabs to oversized stone blocks. Additionally, the surface of at least one capstone was covered by (older) engravings. Further megalithic elements were found in the form of a standing stone. This three-metre-long slate stone had a slightly trapezoidal shape and stood at the edge of a five-metre-wide strip cutting through the necropolis from southwest to northeast. It showed no archaeological features and was assumed to have been a pathway. Regarding the average grave size, the multiple burials measured 0.62 m^2, while the graves containing the remains of one or two individuals were slightly smaller at 0.53 m^2.

The three sites assessed on the northern shore of Lake Geneva show a similar picture: All were located on natural terraces around 300 m north of the modern shoreline. In addition, the raw material used to construct the stone cists originates from local sandstone. While the graves recognised within the sites of Corseaux-sur-Vevey, and Pully, Chamblandes, consist exclusively of stone cists, they represent only 41% at the necropolis of Lausanne, Vidy. Similarly to those at Genevray, the remaining graves at Vidy are wooden cists or simple pits with no evidence of specific funerary architecture. The stratigraphic data showed that the capstones of most stone cists were below the Neolithic surface. Possible grave markers in the form of smaller standing stones were noted. Additionally, it appeared that the smaller single burials were grouped around a larger collective stone cist grave at the site of Corseaux-sur-Vevey.

The sites assessed on the Swiss Plateau consist exclusively of stone cists. So far, the only larger necropolis found is Lenzburg, Goffersberg, with 16 graves at an average size

of 1.06 m^2. Since they appear to have been arranged at distances between 1 and 3 m, the necropolis is estimated to originally have consisted of around 60 stone cists. The used slabs weigh up to 200 kg and consist of local limestone. Additionally, it was suggested that the grave coverings were visible on the Neolithic surface and that smaller stone slabs located between the stone cists represent grave markers. In this context, a cylindrical stone found next to the single stone cist from Wettingen was also interpreted as a possible grave marker (similar to the ones found on the northern shore of Lake Geneva). At least five stone cists were found at Däniken, though it remains unclear if they belong to the same site or denote different grave groups. A sandstone slab between two graves was interpreted as a grave marker and/or standing stone. Poorly preserved bone fragments were discovered at its base. Perhaps these human remains could represent deposits of bones cleared from the stone cists. Additionally, all sites are in the vicinity of larger rivers: Lenzburg and Däniken are 1–3 km from the Aare, and Wettingen is some 750 m from the Limmat.

Finally, regarding peripheral sites, some interesting structures that offer insight into the spatial organisation of the necropolis of Chiomonte have been identified:

- The stone cists appear to have been grouped relatively close together. In addition, larger stone slabs were found next to four graves and thought to represent markers.
- A larger stone cist or chamber contained commingled human remains, as well as stone fragments, charcoal, calcined bone, and a few pottery sherds. This led to the interpretation that it might have represented an ossuary, possibly for cleared-out human remains from other graves.
- A small open zone, delimitated by stone cists and a row of different stone blocks, was described as a ceremonial area.
- A structure of five to six postholes was assumed to have been a structure to place the deceased.
- Within a larger pit, several stacked slabs were found, probably representing a deposit of building material for stone cists.

The two other sites represent smaller grave groups. At Montagnieu, six smaller stone cists and two pit graves were found along the rock face on both sides of a cave opening. Additionally, the single stone cist found at Niederried on the northern shore of Lake Brienz was probably part of a smaller grave group.

6.2. Treatment of human remains

The placement of most primary burials in all zones appears to have been pretty uniform, as most were positioned on the left side of their body (or, less frequently, in a supine position) with the knees bent to the left. The legs were contracted, with the level of flexure varying significantly between the knees well below the pelvic level to the knees touching the chest of the individual. The arms were either crossed over the chest or stretched alongside the torso. A more detailed assessment of the specific placement of primary burials was omitted in this study, as taphonomic processes and the effects of waterflow, roots, animals, etc., within the graves greatly affected the human remains over the millennia. This might be especially true considering the presumed widespread practice of manipulating (displacing and/or partially removing) human remains within Western Alpine Neolithic cist graves.

The available data regarding sex, age at death, and burial practice or placement for the assessed graves generally indicate that adult males, females, and children were treated equally regarding the recognisable burial practices (with deviations from this

norm addressed below). This lack of identifiable differentiations regarding sex or age at death of the deceased provides important insights into Neolithic personhood in the context of burial practices, further discussed in Chapter 9.3.

The available data from the stone cists discovered in the Aosta Valley indicate that the site of Villeneuve consisted almost exclusively of primary burials (87%) of mainly adult individuals (79%) with the head oriented west to southwest, facing north. With the exception of one double burial, the graves contained one individual, indicating single use of the stone cist graves (average MNI per grave of 1.05). In contrast, within the necropolis of Vollein, the individuals were mostly oriented towards the south-southwest. While most graves presumably contained a single, primary burial as well, the photographs from the documentation indicate a large number of bones which were no longer in anatomical connection. Whether this displacement represents secondary manipulations of the human remains can only be speculated currently. In addition, the available pictures allowed for the detection of sporadic multiple burials within this site. Similarly, the isolated grave of La Salle, Derby, can be addressed as a multiple grave. More obvious secondary burial elements could be identified within the grave group of Monjovet, where skull depositions and the moving of bones can be assumed for 80% of the graves.

Regarding sites in the Tarentaise Valley, the limited available data from the graves discovered in Bourg-Saint-Maurice indicate single primary burials probably oriented towards the northeast. In contrast, primary burials represent only about 40% of the assessed individuals at the site at Aime. They indicate the preferred placement in a supine position (with the knees bent to the left side of the body), generally oriented with the head towards the east. In addition, two of the five assessed graves represent multiple burials of four individuals (resulting in an average MNI per assessed grave of this site of 2.4). As some individuals are only represented by skull fragments, the secondary placement of human remains seems likely.

The assessed sites of Neolithic cist graves in the Upper Rhône Valley show heterogenous burial practices but were generally oriented northeast.

- All three stone cists from Saint-Léonard are collective burials with multiple usage phases and an average MNI of 3.67. Two consist of successive primary burials, while Tombe 3 shows different secondary burial elements such as the deposition of human remains and cremations.
- At the necropolis of Sion, Remparts, four collective stone cist graves containing secondary deposited, commingled human remains of up to 13 individuals were found next to 11 single graves with primary burials. This resulted in an average MNI per grave of 3.06.
- The three other necropolises assessed within Sion (Sous-le-Scex, Chemin-des-Collines, and Avenue Ritz) consist almost exclusively of primary burials (89–93%) of single individuals (average MNI of 1.07 to 1.31). The few exceptions are made up of one collective grave from Sous-le-Scex with secondary burial elements and simultaneous double burials. As mentioned, the orientation of the individuals was generally with the head in the northeast. Only within the site of Sous-le-Scex was a change in orientation recognisable in regards to different stratigraphic layers (from the northeast to the north and finally east).

Concerning the southern shore of Lake Geneva, the vast necropolis of Thonon-les-Bains, Genevray, displays a great variability of burial practices: around 60% of the analysed individuals were primary burials. The placement of a few deviated from the norm, with them lying on the stomach or right side of the body. The individuals were mostly oriented with the skull in a northeast direction, but a few had their heads towards the west. Almost half of the analysed stone cists (42%) and almost all wooden cists and/or earth pits contained one single primary burial. For the graves with two or more individuals, a simultaneous

burial was suggested for only a minority, as most were identified as successive primary burials. Multiple graves of at least three individuals represent 28% of all analysed graves, and the average MNI per grave of this site is 2.23. In addition to the manipulation of previously placed human remains, these collective graves show a greater variability of secondary burial elements. For example, clear secondary burials could only be determined for subadult individuals. In addition, the "surplus bones" are almost exclusively from subadult individuals.

The burial practices of three larger necropolises on the northern shore of Lake Geneva show a similar picture to the ones encountered at Genevray:

- Most primary burials of the site of Corseaux-sur-Vevey, En-Seytion, were placed on the left side of their body, with the head generally oriented towards the east, facing south. The single graves appear to have been largely limited to subadult individuals. Almost half of the analysed graves from this site (47%) are collective burials containing the remains of three to a maximum of seven individuals, resulting in a relatively high average MNI of 2.87 per grave of this site. Successive primary burials are assumed for the collective graves. Apart from the secondary displacement of human remains, no evidence of secondary burial elements was noted.
- Also, the primary burials of Pully, Chamblandes, were uniformly oriented with the head towards the east, and 26% of the graves contained three to a maximum of seven individuals. A unique feature noted for this site is the (reported) presence of exclusively male and female individuals for some collective burials.
- The available data from the necropolis of Lausanne, Vidy, indicate 77% of the recovered/analysed individuals to have been primary burials. The secondary burial practices consist of the displacement of bones, the deposition of cremations or "surplus bones", and the removal of skeletal elements ("réductions"). Primary burials were oriented with the skull northeast to southeast. At least two bodies were placed in the opposite direction, towards the southwest. Collective graves with the remains between three to a maximum of eight individuals represent 22% of the necropolis, and the average MNI for all graves is around 1.9.

For sites located on the Swiss Plateau, only the necropolis of Lenzburg, Goffersberg, offers insights into the specific burial practices: The primary burials were generally oriented in a northeast-southwest direction. They represent only about half (43%) of the total number of identified individuals, as a variety of secondary burial elements could be observed in the form of bone depositions, reductions and cremations. Of the stone cists, 75% represent multiple burials, and they had the highest minimum number of individuals for all studied sites (7.56). A possible selection on the basis of the sex for adult primary burials could be detected (22 males vs. 10 females). In regards to the specific positioning within the grave, a differentiation between males (northwest) and females (southeast) can be assumed. The actual size of the stone cists seems to have had a certain norm, since it was not influenced by the number of buried individuals or different burial practices. In this context, differences in burial practices could be observed among the individual graves, as some exclusively contained primary burials, while within others, a majority of secondary burials and cremations are assumed.

Regarding the three sites located on the peripheries of the defined zones, the individual buried in the stone cist of Niederried was placed on the right side of their body, with the skull oriented northwest. The human remains found next to the grave can be regarded as a secondary burial element.

The data from the site of Chiomonte are limited. Half of the graves contained a single primary burial and the others contained skull fragments. The deceased were placed on

the left side with the head towards the east (northeast to southeast). The isolated skull fragments could represent the secondary deposition of human remains.

Two of the eight graves from the site of Montagnieu were multiple burials. The commingled human remains within one of them indicate the secondary placement of bones, and that some skeletal elements of the same individual were deposited at different places (inside the stone cist and next to it). Most individuals (63%) from this site can be categorised as primary burials, oriented with the head north to northeast (with the exception of one individual to the southeast).

Grave goods within Western Alpine cist graves

7

In the following sections, the reported grave goods from the assessed sites (Chapter 4) will be covered in detail. The first subchapter (7.1) focuses on the general characteristics and frequency of certain types of items within Neolithic cist graves. This is followed by an evaluation of the (likely) origin of the raw material for three types of grave goods (7.2). Finally, the last subchapter (7.3) covers a typological comparison of specific types of grave goods.

7.1. Reported grave goods within the assessed sites

The following section is subdivided focusing on the relevant zones of the Western Alps. See Table 4 regarding the frequency of grave goods within sites and Table 5 for a listing of all recognisable grave goods from the covered graves.

Very limited information was previously available from grave goods of stone cists from the Aosta Valley, especially the necropolis of Vollein. After a first assessment, potential grave goods were identified in at least 15% (n = 10) of all graves from this site. They consist of marine shell objects, such as three Glycymeris shells with a large, centred perforation and smaller seashell fragments of Glycymeris and Columbella. An interpretation as bracelets appears likely. Further, some 50 small jet disc beads were recovered, marking the first within Neolithic graves in the Aosta Valley. Remarkably, one additional disc bead (probably) made of seashell was found, which most likely represented an imitation of the ornamental objects made of jet. Another ornamental object was a small tube-shaped bead, probably made of animal bone. Finally, five (unworked) fragments of rock crystals, originating from the cist graves, were found in the archive of the Soprintendenza Aosta.

Grave goods were only mentioned within two stone cists of the Villeneuve necropolis, resulting in a ratio of just 6%. They consist of one stone axe, two smaller stone tools, and a perforated boar tooth. Finally, at least two perforated shell fragments were mentioned, and they originated from the stone cists of Saint-Nicolas and Sarre.

All assessed stone cist graves of the site of Aime in the Tarentaise Valley contained grave goods. These consist of a wide range of objects. Three graves contained between 15 and 48 jet disc beads, with their placement near the chest area of the buried individuals indicating necklaces. Different pigments were noted in four out of five graves. Further, one flint and one rock crystal arrowhead, with an additional rock crystal fragment, and diverse animal bone elements, such as an awl and a long bone of a bear, were found.

No grave goods were mentioned for the graves of the site of Bourg-Saint-Maurice.

Regarding the assessed sites in the Upper Rhône Valley, the three graves from Saint-Léonard contained a relatively large number of grave goods. Two of these had a set of seven arrowheads made of different materials (flint, greenstone or rock crystal), a stone axe blade, and between 80 and 100 stone seed beads. It is likely that the latter represent imitations or local substitutions of jet disc beads. The third grave also contained a stone

Site	Grave	Ornamental objects	Tools	Animal bones	Pottery	Other
Quart, Vollein	T2	15 jet disc beads				1 rock crystal fragment
	T14	1 animal bone bead				
	T17	1 shell bracelet (Glycymeris)				
	T21	1 shell bracelet (Glycymeris)			Small pottery shards (?)	2 rock crystal framgents
	T26				Small pottery shards (?)	
	T31	1 shell bracelet (Glycymeris)				
	T33	1 shell disc bead				
	T40					Shell fragments (Glycymeris, Columbella)
	T43					6 calcinated bone fragments
	T55	1 jet bead				Shell fragments (Glycymeris, Columbella)
	T57					2 rock crystal framgents
Villeneuve, Champ Rotard	T19		1 stone ax, 1 flint scraper			1 quartz fragment
	T25	1 perforated boars tooth				
Sarre	?	2 perforated sea shells				
Saint-Nicolas	?	3 perforated sea shells				
Aime, Le Replat	T1		1 bone awl			
	T3	15 jet disc beads				Ochre
	T4					1 rock crystal fragment, red ochre
	T5	35 jet disc beads, 2 stone beads/pendants		1 bear ulna		Ochre
	T6	48 jet disc beads	2 arrowheads (1 flint, 1 rock crystal)	2 animal bones (?)		Ochre
Saint-Léonard, Les-Bâtiments	T1	100 stone seed beads	7 arrowheads (6 flint, 1 greenstone), 1 stone axe	1 cow costa		
	T2	80 stone seed beads	7 arrowheads (2 flint, 2 greenstone, 2 rock crystal, 1 quartz), 1 stone ax blade, 1 flint blade	Bird bones		1 Rock crystal fragment
	T3		1 flint arrowhead, 1 stone ax fragment	1 sheep mandible, 1 bear metacarpus	1 pottery shard	
Sion, Place et Rue des Remparts	T3	Beads and pendants (?)	Flint and rock crystal arrowheads and tools			
	T4		1 stone ax (?)		Pottery shards (?)	Rock crystal fragments (?)
	T5	Beads and pendants (?)	Flint arrowheads, 1 bone needle		Pottery shards (?)	Rock crystal fragments (?)
	T8	Disc beads (?)	1 bone awl			

Site	Grave	Ornamental objects	Tools	Animal bones	Pottery	Other
Sion, Place et Rue des Remparts	T20	1 shell bracelet (Glycymeris)				
	T24	1 shell bracelet (Glycymeris)				
Sion, Sous-le-Scex	T5		1 rock crystal arrowhead		Pottery shards (?)	Ochre
	T14		2 flint blades			Calcinated bone fragment(s)
	T17					Ochre
Sion, Chemin-des-Collines	T6					Ochre
	T9	1 shell bracelet (Glycymeris)				
	T10	2 perforated boars tusks				
	T14					Ochre
	T15					Ochre
	T16					Ochre
	T18					Ochre
	T24	1 shell bracelet (Glycymeris)				
Sion, Avenue-Ritz	T11		2 bone awls			1 shell fragment
	T12					Ochre
	T13	1 shell bracelet (Glycymeris)				
Thonon-les-Bains, Genevray	T12	7 perforated canine teeth (dog, lynx, fox)				
	T14	1 jet disc bead				
	T15	2 tubular shell beads (Dentalium)				
	T29	1 deer antler pendant				
	T42	46 jet disc beads				
	T55				Round-bottomed bowl	
	T84	3 carved bird bone fragments				
	T88	88 jet disc beads	1 rock crystal arrowhead			
	T95	811 jet disc beads, 41 limestone disc beads, 7 type Glis buttons (limestone), 42 type Doppelknopf buttons (limestone), 1 perforated sea shell (Charonia Nodifera)				
	T99	47 jet disc beads				
	T100	29 limestone disc beads, 1 jet disc bead				
	T101	1 perforated sea shell (Charonia Nodifera)				

Table 5: Compiled data of grave goods from assessed graves (n = 51).

Site	Grave	Ornamental objects	Tools	Animal bones	Pottery	Other
Thonon-les-Bains, Genevray	T104					5 flint fragments
	T105	213 jet disc beads				
	T106	161 jet disc beads, 5 limestone disc beads				
	T134	5 shell beads (Columbella)				
	T139		1 flint arrowhead		Bagshaped pot with handles	
	T141	1 tubular pendant (limestone)				1 shell fragment
	T151	1 rounded elk antler				
	T158	1 tubular pendant (limestone)				
	T169					1 rock crystal fragment
	T818	1 triangular pendant (nephrite)				
	T1004					1 boar tusk fragment
	T1005	1 rounded elk antler				
	T1044		5 flint arrowheads			
	T1189	1 shell beads (Columbella)	1 flint arrowhead			
	T1277	50 jet disc beads				
Lugrin, Le Petit-Tronc	?	3 perforated sea shells				
Corseaux-sur-Vevey, En-Seytion	65-T1	1 perforated sea shell				
	65-T3	2 perforated sea shells, 1 deer antler pendant				
	T1	8 jet disc beads, 97 limestone disc beads, 26 type Glis buttons (limestone)			Pottery shards (?)	
	T3					Ochre
	T4	28 jet disc beads, boar tusk pectoral (31 perforated boar tusk fragments)				Ochre
	T5	75 jet disc beads				Ochre
	T7	131 jet disc beads			Pottery shards (?)	
	T10		1 flint blade		Pottery shards (?)	
	T15					1 flint chip
	T16	1 perforated sea shell	1 flint arrowhead			Ochre
	T20					Ochre
Pully, Chamblandes	div.	6-8 boar tusk pectorals (?), variuos perforated sea shells, various types of beads and/or pendants (jet, limestone, stone seed)	1 perforated stone ax (Lochaxt) (T16?)			Ochre

Site	Grave	Ornamental objects	Tools	Animal bones	Pottery	Other
Lausanne, Vidy	T7	1 type Doppelknopf button (limestone)				
	T44				2 bowls with knobs, 1 bottle with perforated knob	
	T71	3 perforated animal bones, 4 perforated animal teeth (3 elk, 1 boar), stone pendant, copper bead (?)				
	T79					Ochre
	T87	Perforated sea shells (?), disc beads (?), type Glis buttons (?)	1 perforated stone ax (Lochaxt), 1 flint ax (type Glis-Weisweil, T30?), 9 flint arrowheads	Elk antler fragment	1-2 bagshaped pots with handles, 1 bottle with handles, 3 bowls, 1 VBQ shard	
	T92				1 bowl (?)	
	T122				Bagshaped pot with handles	
Lenzburg, Goffersberg	SKG 1		1 flint blade		3 pottery shards	2 flint chips
	SKG 4	27 jet disc beads, 4 perforated canine teeth, tubular bead (limestone)	1 perforated stone ax (Lochaxt), 4 flint arrowheads			Fish bones
	SKG 5	4 jet disc beads				1 flint chip/blade
	SKG 7		4 flint arrowheads			
	SKG 8	14 jet disc beads, 31 perforated canine teeth	3 flint arrowheads	Boar tusk fragments, pig canine tooth	2 pottery shards	1 flint chip, 1 galena lump (?)
	SKG 9		1 flint blade			
	SKG 10		3 flint arrowheads		20 pottery shards	
	SKG 11	1 perforated pig tooth	1 stone ax, 1 flint arrowhead, 2 flint blades, 1 flint scraper, 2 bone awls	1 bird beak	5 pottery shards	Birch tar lump
	SKG 12	5 perforated canine teeth	2 flint arrowheads, 1 flint blade, 1 rock crystal arrowhead (?), animal bone comb, 6 animal bone tools (3 awls, 3 chisels)	3 cow long bones, 2 deer bones, 1 sheep/goat bone	2 pottery shards	
	SKG 13	6 jet disc beads, 6 perforated canine teeth	1 perforated stone ax (Lochaxt) fragment, 11 flint arrowheads, deer antler tool, 2 pounding stones	1 dog jaw	59 pottery shards	2 rock crystal fragments
	SKG 14	72 jet disc beads				
	SKG 15				4 pottery shards	
	SKG 16		2 flint arrowheads	Deer antler fragment		
	SKG 17	3 stone disc beads, 50 perforated canine teeth	1 stone ax, 1 flint arrowhead, 4 flint blades, 1 flint scraper, 1 animal bone tool		Pottery shards (?)	
	FM (2)		1 animal bone awl		Deposition (≥12 vessels)	

Table 5 continued.

Site	Grave	Ornamental objects	Tools	Animal bones	Pottery	Other
Däniken, Studenweid	1/1946	1 jet disc bead	6 flint arrowheads, 1 flint blade			2 flint chips, 1 rock crystal fragment
	2/1946	87 jet disc beads	4 flint arrowheads, 5 flint tools		8 pottery shards	9 flint chips, Ochre
	1/1970	54 jet disc beads	1 stone ax, 1 flint arrowhead, 1 flint blade, 2 flint scrapers		1 beaker, 34 pottery shards	5 flint chips, 1 rock crystal fragment
	2/1970	44 jet disc beads	3 stone axes, 5 flint arrowheads, 2 flint blades, 3 flint scrapers		30 pottery shards	26 flint chips, 2 rock crystal fragments
	3/1970				3 pottery shards	
Erlenbach, Geren	Grab 1		1 stone ax			
Wettingen, Schartenstrasse	?	1 jet disc bead				
Chiomonte, La-Maddalena	T4			1 goat mandible		Flint chips (?)
	T7					1 polished stone fragment
	T9					Flint chips (?)
Montagnieu, Grotte-du-Souhait	Sg		1 stone ax		Pottery shards (?)	
	Sp3	1 perforated sea shell	1 stone ax			
	Sp4				Pottery shards (?)	
	Sp5	1 stone bead (pebble)	1 bone awl		1 pottery shard (Bottom)	
	Sp6		1 flint arrowhead (?)		1 pottery vessel (fragmented)	
	Sp7		3 flint blades			Flint chips (?)

Table 5 continued.

axe blade, but only one flint arrowhead and no beads. Strikingly, different animal bones were found within each grave.

Currently, the available data regarding grave goods from the site of Sion, Remparts, are very limited. For the four collective graves, a relatively large and diverse number of objects is mentioned, consisting mainly of beads and/or pendants, flint and rock crystal arrowheads, pottery fragments, and bone tools. Interestingly, while all of the collective graves contained multiple grave goods, for the single burials, only two Glycymeris shell bracelets were mentioned.

The other three sites assessed within the municipality of Sion contained few grave goods (on average, between 19 and 32% of the graves). In addition, they consisted mostly of one single object or type of object. For the necropolis of Sous-le-Scex, a rock crystal arrowhead, two flint blades, pottery sherds, and ochre pigments were found in three graves. At Chemin-des-Collines, two Glycymeris shells with a large central perforation and two perforated boar tusks were found. The latter was probably imitating one of the shell bracelets. In addition, ochre pigments were noted within five graves. Finally, at the site of Avenue Ritz, three graves yielded two halves of a Glycymeris shell bracelet, a shell fragment, two bone awls and ochre pigments.

The data from the necropolis of Thonon-les-Bains, Genevray, on the southern shore of Lake Geneva, offer insights into the aspect of grave goods of Neolithic cist graves. Regarding the frequency, only 19% of the analysed graves yielded recognisable grave goods, originating almost exclusively from stone cists. The data indicate that the ratio was significantly higher (30%) for graves containing multiple burials.

Most grave goods can be described as ornamental objects, mainly consisting of a total of 1350 jet disc beads from five graves, and 811 of these originating from one single stone cist. Additionally, two characteristic types of limestone beads (“Doppelknöpfe”) and Glys “buttons” originate from the same double burial. The 75 other beads made of limestone are comparable to the jet objects, but slightly larger and of a different colour.

Few perforated shell pendants and beads were found, however, the typical Glycymeris shell bracelets are lacking. Remarkably, two rounded elk antler fragments were recovered, which are assumed to represent imitations of these shell bracelets. Furthermore, there were ornamental objects consisting of a green stone pendant, a deer antler pendant, and bird bones with carvings. Similar to the limestone beads, multiple canine animal teeth pendants originate from a single grave.

Compared with other sites, stone tool grave goods were very scarce, consisting of only eight arrowheads; animal bone tools completely missing. Finally, only two pottery vessels were found in all of the graves.

On the northern shore of Lake Geneva, around 40% of excavated stone cists from the site of Corseaux-sur-Vevey, En-Seytion, contained grave goods. The most frequent type is ornamental objects, such as the approximately 250 jet disc beads. A total of 131 were found within one stone cist. Similar to the necropolis of Genevray, a set of 26 type Glis "buttons" and 97 limestone disc beads were only detected within one collective grave. Unique in comparison with the other zones was a set of 31 perforated boar-tusk fragments, interpreted as a pectoral arranged in two rows, one above the other. The other ornamental objects consist of four perforated shell fragments and a perforated deer antler tip. The few stone tools are made up of one flint arrowhead and one flint blade. Further, the small pottery sherds found within three graves are indistinctive. Pigments were relatively frequent and found within five stone cists.

Only very limited data are available for the other two covered necropolises in this zone. This holds especially true for grave goods clearly assignable to specific grave structures. With that in mind, apparently, six to eight boar-tusk pectorals and one perforated stone axe (Lochaxt) were found within the stone cists of Pully, Chamblandes. The other reported grave goods from this site consist of various perforated seashells, different types of beads (made of jet, limestone or stone seed), as well as ochre. Similarly, only a few grave goods from the necropolis of Lausanne, Vidy, have so far been published. They show similarities to grave goods from other sites around Lake Geneva, and contain multiple Glis buttons, Doppelknopf beads, and perforated stone axes (Lochaxt), for example. In addition, some wooden cists contained complete ceramic vessels, such as bag-shaped pots with handles, bottles with handles, bowls with knobs or lugs, and at least one vessel with a square opening (VBQ type).

In contrast, the evaluated sites located on the Swiss Plateau contained a high number of grave goods. This was the case for almost all (88%) of the stone cist graves from the necropolis of Lenzburg, Goffersberg, for example. They consist mostly of ornamental objects; a total of 123 disc jet beads were found within almost a third (31%) of all the graves. Similarly, some 38% contained smaller and larger sets of perforated animal canine teeth (with a total number of 97). The discovered tools mainly consist of flint arrowheads (n = 29), found in half of all the stone cists and comprising up to 11 objects. Further tools are objects made of animal long bones (n = 11) found within five graves. Four stone cists contained one stone axe (fragment), two of which were from a perforated axe "Lochaxt". Rock crystal fragments were exclusively found within the only single burial of the site. While the original vessel shape of the sherds from the stone cist graves could not be reconstructed, the pottery deposited within the funerary monument consists of various vessels: at least two pots, two bottles, and a bowl. Typologically, the most significant is a so-called Pfyn-type jug.

The stone cists at Däniken, Studenweid, show a similar picture in regards to the grave goods; the ornamental elements consist exclusively of jet disc beads. A total of 186 partially fragmented beads were found within four of the five graves. The recovered tools mainly consisted of flint arrowheads (n = 16) found within four of the five graves on this site. In addition, two stone axes and a few flint blades or scrapers were recovered. In contrast to the graves from Lenzburg, no animal bone tools were found. Numerous pottery fragments were discovered within these stone cists. Only a decorated beaker, a "Schulterbandbecher", could be reconstructed.

Regarding the other sites, only one jet disc bead was found within the single stone cist of Wettingen, Schartenstrasse, and one stone axe in grave 1 from Erlenbach, Geren.

Regarding the assessed sites located on the peripheries of the defined zones, two-thirds of the graves from the site of Montagnieu, Grotte-du-Souhait, contained grave goods. These consisted mostly of single objects, such as a perforated seashell (Triton), a stone axe, or pottery sherds. Of the latter, the original vessel shape could be reconstructed into two bowls

(Knickwandschüsseln) and one to two round-bottomed pots. Only a few possible grave goods were found within three of the ten stone cists of Chiomonte, La-Maddalena, consisting of one polished stone fragment, one animal bone, and a few flint chips.

7.2. Origin of raw material

This subsection covers the likely origin of the raw material of flint objects from three sites (Chapter 7.2.1), as well as jet (Chapter 7.2.2) and seashells (Chapter 7.2.3) in general.

7.2.1. Flint

By means of a specialised rock examination, Jehanne Affolter was able to determine the place of origin of the raw material of selected grave goods. The determination method used is based on the nondestructive procedure of identifying the sedimentary microfacies of each flint under a stereomicroscope. The surfaces are slightly moistened, making the flint up to 2 mm transparent, to allow for the determination of the sedimentological and microfacial characteristics of the studied object. This information can subsequently be used to determine the origin of the rock samples (Affolter, 1997, 59; Altorfer and Affolter, 2011, 39–40).

Saint-Léonard, Les-Bâtiments: The origin of some flint objects from these three stone cist graves was determined. Unfortunately, the results have not been published yet, though they indicate far-ranging exchange networks from Saint-Léonard to the Swiss Plateau, as well as Northern Italy and Southern France (unpublished, communication with Jehanne Affolter, 2020).

Lenzburg, Goffersberg: A total of 48 flint and four stone objects from stone cist graves were accessible and examined by Affloter in 2020: 62% of the raw material of the flint originates from the area of Olten (Solothurn, Switzerland), which is about 25 km west of Lenzburg. In detail, ten objects are from the known mining site of Olten, Chalchofen, four from Egerkingen/Oberbuchsitten, and 16 others from the area between Olten and Aarau. A quarter of the silices (n = 12) originates from the Lägern, which is about 20 km to the northeast of Lenzburg. The remaining five flint objects show a northwestern place of origin: the raw material of three arrowheads and one blade is from Lausen, Chohlholz (Basel-Landschaft, Switzerland), about 42 km away, and finally, another arrowhead stems from Alle (Jura, Switzerland), about 100 km northwest of Lenzburg. The analysed objects originate from 11 of the 16 stone cists, with no grave showing a concentration of specific sites of origin (Fig. 150).

Over a third of the silices (n = 17) showed traces of exposure to fire, with 14 found to have been slightly heated and three clearly burned. In addition, two of the four stone axe blades exhibited heat effects. The distribution of these objects shows that they were found within 81% of the stone cists of Lenzburg. Of special interest are graves SKG 11 and 12 with remains of cremated burials; there, a slightly increased proportion of 50% of the analysed objects showed traces of exposure to fire.

Däniken, Studenweid: 20 flint objects found within the stone cist graves were examined by Affloter. Of the objects from grave 1/1946, four originate from the area between Olten and Aarau. Noteworthy is the reddish arrowhead, whose raw material comes from southern Alsace (France). Similarly, three of the four analysed flint objects of grave 2/1946 originate from the area between Olten and Aarau. Only the raw material of one arrowhead comes from Alle (Jura, Switzerland), which is about 85 km northwest of Däniken. Seven flint objects from grave 1/1970 were examined, and three originate from the area between Olten and Aarau. The raw material of the remaining silices is from the Lägern (about 45 km northeast of Däniken) (Fig. 150).

The results of the analysed flint objects show that mainly local raw material was used, since 67% (n = 12) of the objects originate from mining areas less than 10 km from

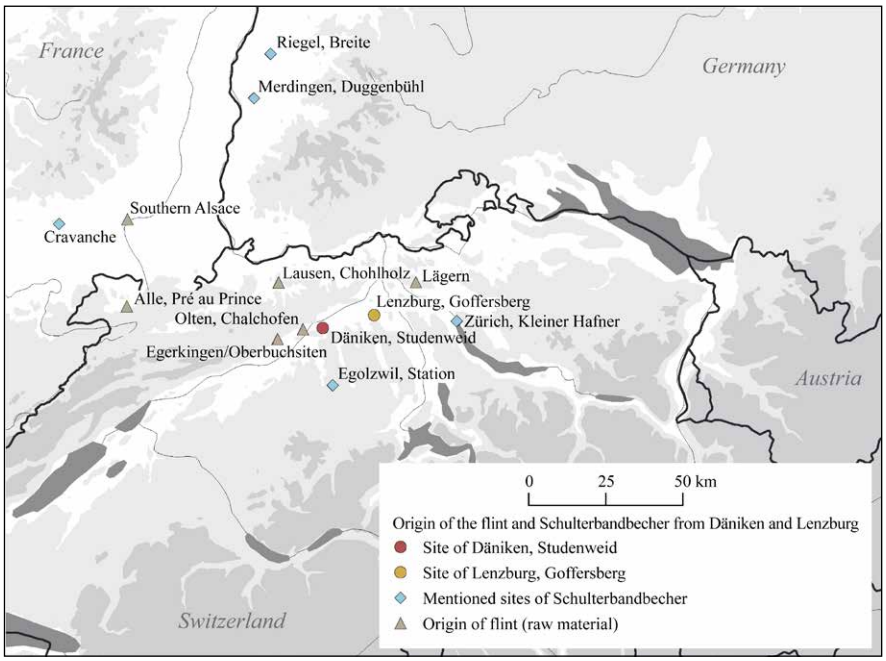


Figure 150: Map depicting the origin of the flint from the sites of Däniken and Lenzburg, as well as the covered Schulterbandbecher.

the site. Two to three arrowheads from the graves of 1946 show relations towards the northwest, reaching as far as southern Alsace. In addition, only two of the analysed objects from this site showed traces of exposure to fire.

7.2.2. Jet

Jet, a special type of fossilised wood, is formed from alluvial wood buried in clay sediment that has been saturated with bitumen. It is usually found with oil shale. The visible grooves of jet are remnants of the wood that was in contact with oil shale; even fine remains of tree rings are sometimes recognisable (Brechbühl, 2005, 36–39). Jet is compact enough to be carved and polished and therefore has been used for jewelry production since the Paleolithic.

In Europe, large jet outcrops (mining areas) are known in the Paris Basin (France), Whitby/Yorkshire (England), and the Swabian Alb (Germany). The latter is located on the northwestern side of the Swabian Alb and runs along the Neckar River. No jet sources are known in today's Switzerland. During the Jurassic period, Europe was a collection of islands separated by warm, shallow seas. Jurassic oil shale was deposited in this epicontinental basin. Wherever these strata occur, it is theoretically possible to find jet, thus there could have been earlier outcrops in Switzerland, possibly in the median Prealps (Brechbühl, 2005, 42–43). Indeed, a possible jet source has been suggested in the Prealps of Western Switzerland (Ligouis, 2006, 197). However, this could refer to a mention of jet being found near Aigle (Vaud, Switzerland) in 1775 (Wehrli, 1919, 84).

The current research indicates that it seems unlikely that the jet found in the context of the Neolithic cist graves in the Western Alps is of local origin. In this context, Hallstatt period jet objects found in Switzerland are assumed to have originated from the Swabian Alb (Rochna, 1962, 69, 73). Also, for Dominique Baudais, disc jet beads found within Chamblandes-type graves have their origin in the Rhine area, within the context of the Neolithic "cultures" of Hinkelstein, Grossgartach, and Rössen (Baudais et al., 2017, 157).

This raised the question of whether the origin of the disc jet beads found as grave goods within the cist graves can be determined. According to communication with Bertrand Ligouis (University of Tübingen, Germany, 2020), many chemical analysis methods have been tested to determine the origin of jet, but so far, most have been unsuccessful. This is mainly because the chemical composition of the jet changes when subjected to the soil

over millennia, making it of little use. The only examination methods that have been successfully applied are light reflection and fluorescence microscopy. This requires the extraction of a small sample (1 mm) from the object and provides a solid database on the wood structures of the jet, its fluorescence, and its reflectivity. In the case of jet objects in the context of archaeological sites, it is necessary to check if the local or regional environment has potential jet-bearing formations. If so, a few pieces should be collected onsite for comparative analysis with the archaeological object.

Such an analysis would be very interesting, especially since disc jet beads were found within graves from the Aosta Valley and Lake Geneva to the Swiss Plateau. This is not possible in the context of this research project. In summary, with the few available sources and keeping reservations in mind, it can be assumed that the jet from the disc beads found within Neolithic cist graves probably originated from Southern Germany.

7.2.3. Seashells

A diverse range of marine shells were used as raw materials for ornaments within Neolithic cist graves in the Western Alpine region. These consist mainly of Glycymeris, Columbella, Triton, and Nodifera types. As the name suggests, these shells originate from the Mediterranean (Borrello et al., 2009, 37–40; Dimitrijević and Tripković, 2006, 246).

7.3. Typological evaluation

This subchapter covers the typological evaluation of selected types of grave goods, namely ceramic vessels from five specific sites (Chapter 7.3.1), two axe types (Chapter 7.3.2), and two limestone beads (Chapter 7.3.3), as well as shell bracelets (Chapter 7.3.4) and boar-tusk pectorals (Chapter 7.3.5).

7.3.1. Pottery

Thonon-les-Bains, Genevray (Fig. 151): Only two ceramic vessels were found within the graves of this necropolis. For Baudais, the small bag-shaped pot with two handles from T139 is comparable to the ceramic style of Egolzwil, while the round-bottomed bowl from T55 more likely belongs to the classical Cortaillod or NMB (Baudais et al., 2017, 154–155, 347).

Lausanne, Vidy (Fig. 151): Only a few ceramic vessels originating from the graves of this site have so far been published. Bag-shaped pots with handles, spherical pots, or bottles with handles, bowls with knobs or lugs, and sherd(s) from a vessel with a square opening show influences/origins from the Neolithic ceramic styles of the Chasséen, Cortaillod ancient, and VBQ (Moinat, 2007, 215, 219).

Lenzburg, Goffersberg (Fig. 151): The ceramic fragments found within the stone cist graves SKG 13 and SKG 17 can be associated with the Egolzwiler and Early Central Swiss Cortaillod pottery type (de Capitani, 2007a, 227–228; Wyss and Scheffrahn, 1998, 100).

Regarding the pottery deposited within the funerary monument, a Pfyn-type jug like the object from Lenzburg was found in Zurich, Mozartstrasse, Layer 4, dated to 3620–3600 BCE (Stöckli, 2009, 59–65, Taf. 11, 20). Similar jugs are already present within older layers with pottery of the Cortaillod type (Layer 5 and 6) of Zurich, Mozartstrasse (Bleuer and Hardmeyer, 1993, 105, 113). Fragments of jars with handles were also found in Layer 4E of Zurich, Kleiner Hafner (Suter, 1987, Taf. 36.24), or Zurich, Kan-San, Layer 9 (Stöckli, 2009, Taf. 7, 34–38). Therefore, this vessel type could have already been in use around 3900/3850 BCE.

Regarding the other ceramic objects, an S-shaped pot with a knob under the rim shows typical elements of the Central Swiss Cortaillod. In addition, the two cups with rounded bases and the (potential) bottle point to this ceramic style, as they are not typical elements of the chronologically younger Central Swiss Pfyn (Bleuer and Hardmeyer,

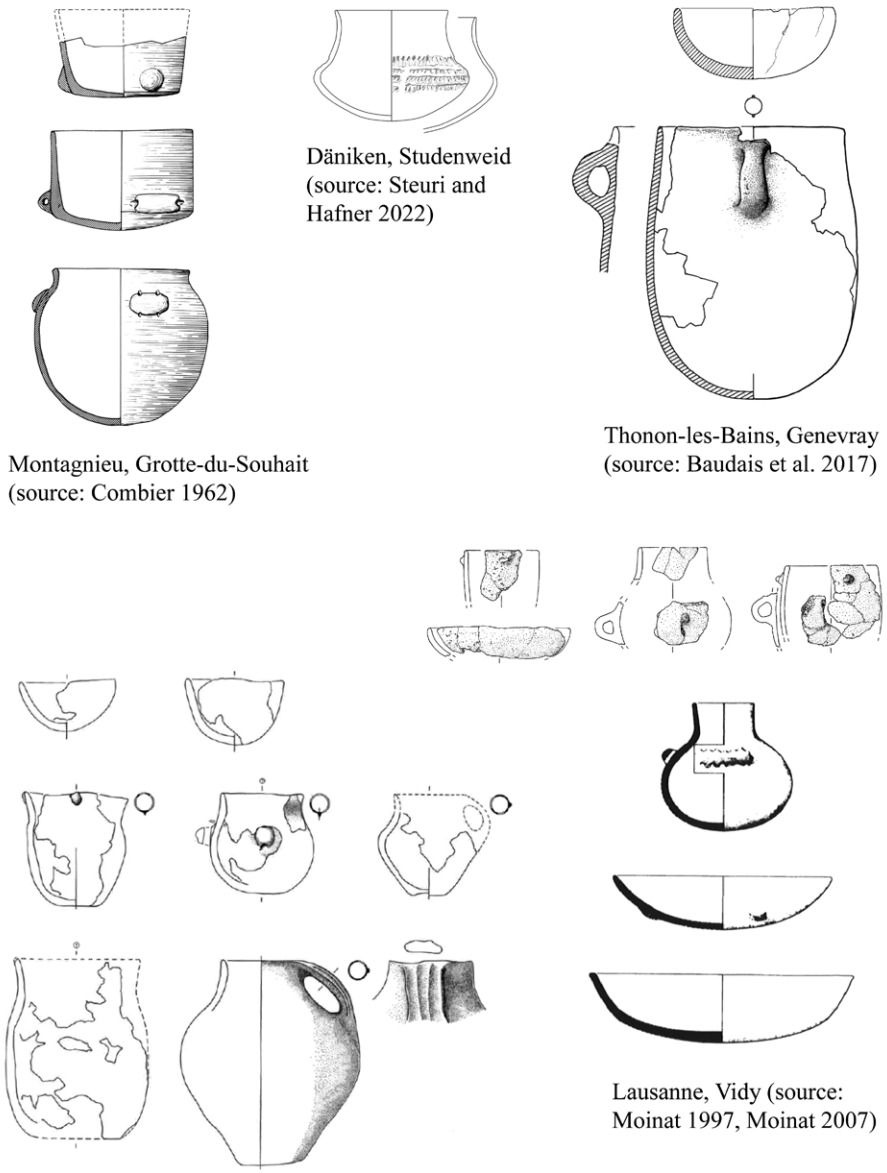


Figure 151: Selection of ceramic vessels from the assessed sites (unknown scale).

1993, 196, Fig. 227, 295; Suter, 1987, 114). The other vessels are heavily reconstructed or the original shape is not discernable anymore; therefore, these vessels are not considered for typological evaluation.

According to René Wyss, several sherds with silt application were found within the grave monument (Wyss and Scheffrahn, 1998, 177–178, 134). Although a typical element of the Pfyn pottery type, silt application was already used on ceramics of the Cortaillod type; as Annick de Capitani noted, some fragments with silt application are found at Egolzwil 2, Layer II (de Capitani, 2007b, 231). According to Othmar Wey, ten fragments at Sursee-Zellmoos (excavation 1991) and over 15% of the pots at Schenkon-Trichtermoos have silt application (Wey, 2001, 81–82).

In summary, the pottery deposited within the funerary monument shows elements of the Pfyn pottery type that were already present in the Classical to Late Central Swiss Cortaillod.

Däniken, Studenweid (Fig. 151): The typologically most important object from this site is the "Schulterbandbecher". Similar beakers with bands of ornamental elements were found within at least six other sites on the Swiss Plateau. Only the ones from Egolzwil (Lucerne, Switzerland) and Zurich (Zurich, Switzerland) are stratified and well dated.

- Egolzwil, Station 3: Two beakers with bands of grooves were among the pottery of this wetland settlement site, eponymous for the so-called Egolzwil ceramic type (de Capitani, 2013, 62–64). The combination of dendrochronology and radiocarbon data allowed the dating of Egolzwil 3 to 4280–4250 BCE (Stöckli et al., 2013, 141).
- Zurich, Kleiner Hafner: Among the typical Egolzwil-type pottery from Layer 5a of this wetland settlement site were several beakers with ornamental bands (Suter, 1987, 109, 291, 295). Dendrochronological and radiocarbon data place this layer in the period of 4280–4250 BCE (Stöckli, 2009, 17, 55).

The practically contemporaneous beakers from Zurich and Egolzwil show different forms and ornamental elements. Comparatively, the object from Däniken shows some stylistic parallels, such as the rounded bottom and neck of the beakers from Egolzwil, or the sharp bend and ornamental bands of the fragments from Zurich.

The beaker from Däniken was previously typologically attributed to the broad "Wauwiler Group", a grouping of different globular beakers of the Late Rössen ceramic type (Dubuis and Osterwalder, 1972, 308–314). Named after a burial ground near Leuna (Saxony-Anhalt, Germany), the "Rössen Culture" was widespread in the middle of the 5th millennium BC, mainly in southern and central Germany. Christian Jeunesse (re)grouped these beakers of the southern Upper Rhine plain and the Swiss Plateau (including the one from Däniken) with the introduction of the "Bruebach-Oberbergen Group". The characteristic feature of this pottery style is a mostly horizontal decoration pattern of bands of comb punctures (Jeunesse, 1990, 89–90). But Werner Ernst Stöckli counts the beakers of the "Bruebach-Oberbergen group" again to belong to the Late Rössen (Stöckli, 2009, 174), and for Denaire et al., they represent an evolution of the so-called Bischheim pottery style, a regional expression of the Late Rössen (Denaire et al., 2011, 33).

In summary, these beakers typologically date within the period of 4400–4000 BCE (Denaire et al., 2011, 43–46) and indicate stylistic affiliations of the object from grave 1/1970 of Däniken towards southern Germany. The most comparable beakers were found in the Upper Rhine area, such as at the sites of Merdingen and Riegel (both Baden-Württemberg, Germany) or Cravanche (Bourgogne-Franche-Comté, France), showing the same proportions and ornamental elements as the beaker from Däniken (Figs. 150, 152) (Gleser, 1995, 100, Taf. 23).

Whether the shoulder band cup from Däniken actually comes from the Upper Rhine region cannot be clearly determined, and only a pXRF analysis ("portable dispersive X-ray fluorescence") of the mineralogical composition of the clay used could provide clues.

Regarding the other pottery fragments from this site, one sherd from grave 2/1970 has a knob under the rim. This is generally a frequent element for the "Egolzwil" or "Cortaillod" pottery styles, dating around 4300 to 4000 BCE. In addition, another pottery fragment from the same grave probably has a notch on the rim and, according to Stöckli, pots with notches on the rim are typical for the period around 4300 BCE (Stöckli, 2009, 174).

Montagnieu, Grotte-du-Souhait (Fig. 151): An almost complete, small "Knickwandschüssel" bowl with a tunnel lug was found in grave Sp6 and shows typical features of the so-called Saint-Uze, or younger Chasséen, ceramic type (Stöckli, 2016, 104). An additional base fragment from Sp4 also appears to be from a "Knickwandschüssel", with at least one knob. The pottery sherds found between the bones in the ossuary (outside of Sp5) are probably from a round-bottomed pot. Typologically, this would fit well with the bag-shaped pots with opposite handle lugs of the Saint-Uze or Chasséen ceramic type

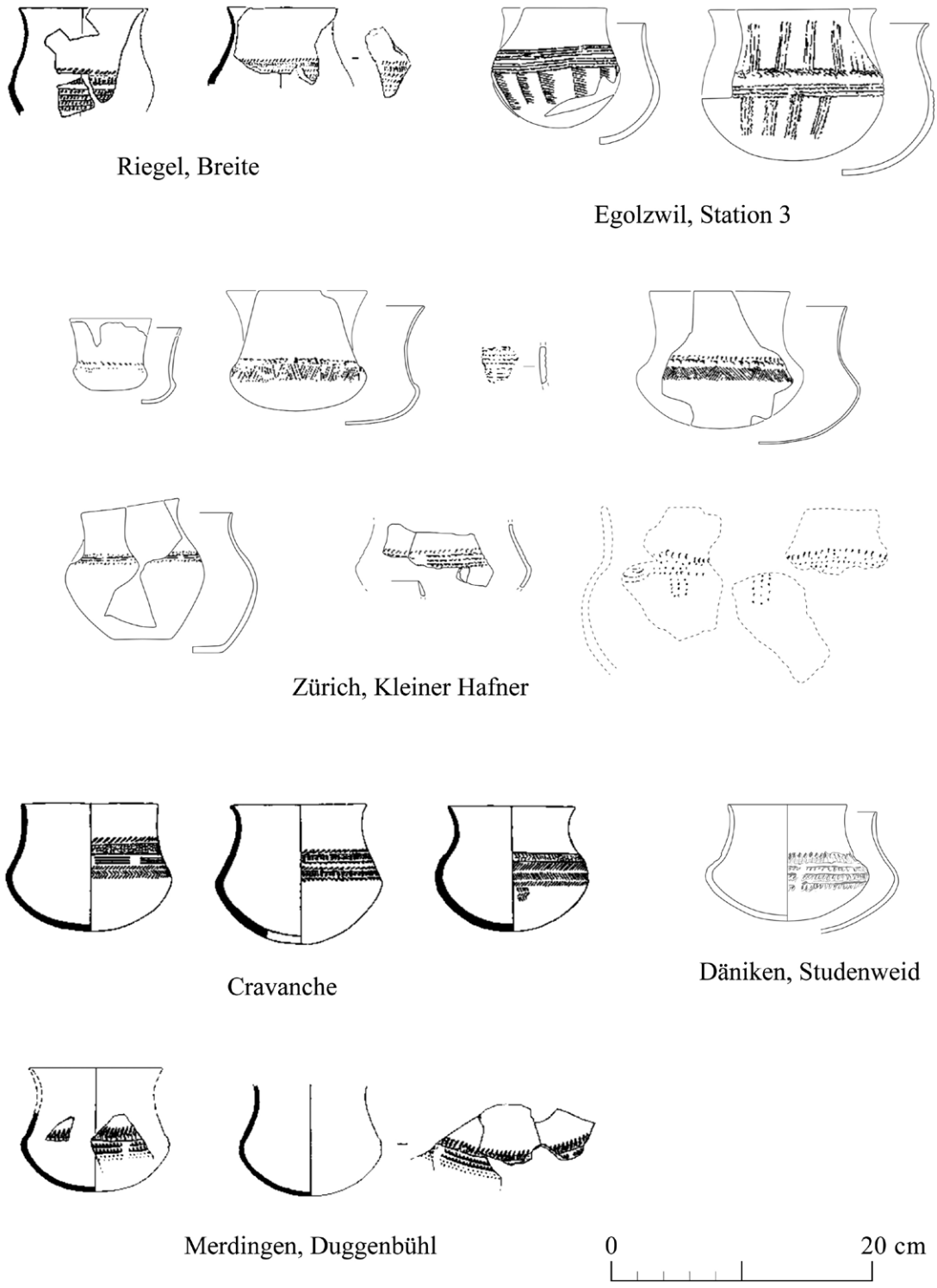


Figure 152: Comparison of regional Schulterbandbecher beakers (source: Steuri and Hafner 2022).

(Stöckli, 2009, 385–388). In the area of present-day Switzerland, numerous examples of bag-shaped pots are also found in the ceramic facies of the Néolithique moyen I and Cortaillod ancient (Stöckli, 2009, 266–267). A small, rounded pot was found in grave Sg. At least one elongated knob with two vertical perforations was placed on the shoulder of the vessel (showing similarities with the Chasséen or Cortaillod ancient ceramic type (Stöckli, 2016, 104).

7.3.2. Selected axe types

Perforated stone axe "Lochaxt" (Figs. 153, 154): At least four of these axes were found within cist graves of the sites of Lenzburg, Goffersberg; Lausanne, Vidy; and Pully, Chamblandes. The oldest perforated axes from the study area have originated from settlement sites on the Swiss Plateau. They were found in layers in relation to the "Egolzwil" pottery style, dating after 4300/4200 BCE. They have a vast area of circulation in Europe (Thirault, 2007, 247) until the middle of the 3rd millennium BCE (Stöckli, 2016, 267). Local production in Western Switzerland is reported at the settlement site of Saint-Blaise, Bains des Dames (Neuchatel, Switzerland; Ruckstuhl, 2016, 80–81). Generally, these axes are regarded as weapons, prestige objects and/or insignia of rank, rather than tools for woodworking (Stöckli, 2016, 267).

Flint axe type Glis-Weisweil (Figs. 153, 154): These objects with an elongated almond shape, pointed heel, and rounded cutting edge were named after the site of Brig-Glis, Schönbiel, where at least one was found within a stone cist in 1890 (Loretan, 2011, 33–34). Additional flint axes were found within graves of the sites of Lausanne, Vidy, and Lutry, Châtelard (Vaud, Switzerland, Schenk, 1902, 160–161). The main area of circulation for this axe type is around Northern Switzerland, Eastern France (Alsace and Franche-Comté) and Southern Germany (Baden-Württemberg) in the period between 4250 and 3900 BCE. Additionally, the most widely used raw material originates from south of Basel (in Northern Switzerland). It was suggested that these flint objects represent imitations of large Alpine jade axes (Pétrequin et al., 2010, 237).

7.3.3. Selected limestone beads/buttons

Type Glis buttons (Figs. 155, 156): These small limestone beads with a V-shaped perforation are named after the previously mentioned site of Brig-Glis, Schönbiel (Valais, Switzerland). Here, at least five Neolithic stone cists were discovered between 1897 and 1900, containing over 140 of these ornamental objects (Heierli, 1909, 47). Their area of circulation is around Lake Geneva and the Upper Rhône Valley (Baudais et al., 2017, 158) and indeed, they were found exclusively in Neolithic cist graves within these zones: Thonon-les-Bains, Genevray; Corseaux-sur-Vevey, En-Seytion; Lausanne, Vidy, on Lake Geneva; Brig-Glis, Schönbiel; and a pit grave at Saint-Léonard, MTA (Mariéthoz, 2007b, 269–271) in the Upper Rhône Valley.

Doppelknopf bead (Figs. 155, 156): These round limestone beads with a characteristic circumferential groove on the narrow side were only found in one grave from the site of Thonon-les-Bains, Genevray, and Lausanne, Vidy. The type originated from the northeastern Rhine area (Southern Germany) in the context of the Grossgartach and Rössen "culture" until the beginning of the 4th millennium BCE (Baudais, 2007, 172; Moinat, 2007, 217).

7.3.4. Shell bracelet (and imitations)

Large marine Glycymeris shell objects with a large central perforation were found as grave goods within sites in the Aosta (Quart, Vollein, Sarre and Saint-Nicolas) and Upper Rhône valleys (Sion, Remparts, Sion, Chemin-des-Collines). At Sion, Avenue-Ritz, two lunular-shaped Glycymeris fragments had multiple perforations to be combined and used as a bracelet. In addition, two Triton shells with a large central perforation were found within the remains of a stone cist grave at the site of Saillon, Sous-le-Brecls (Valais,

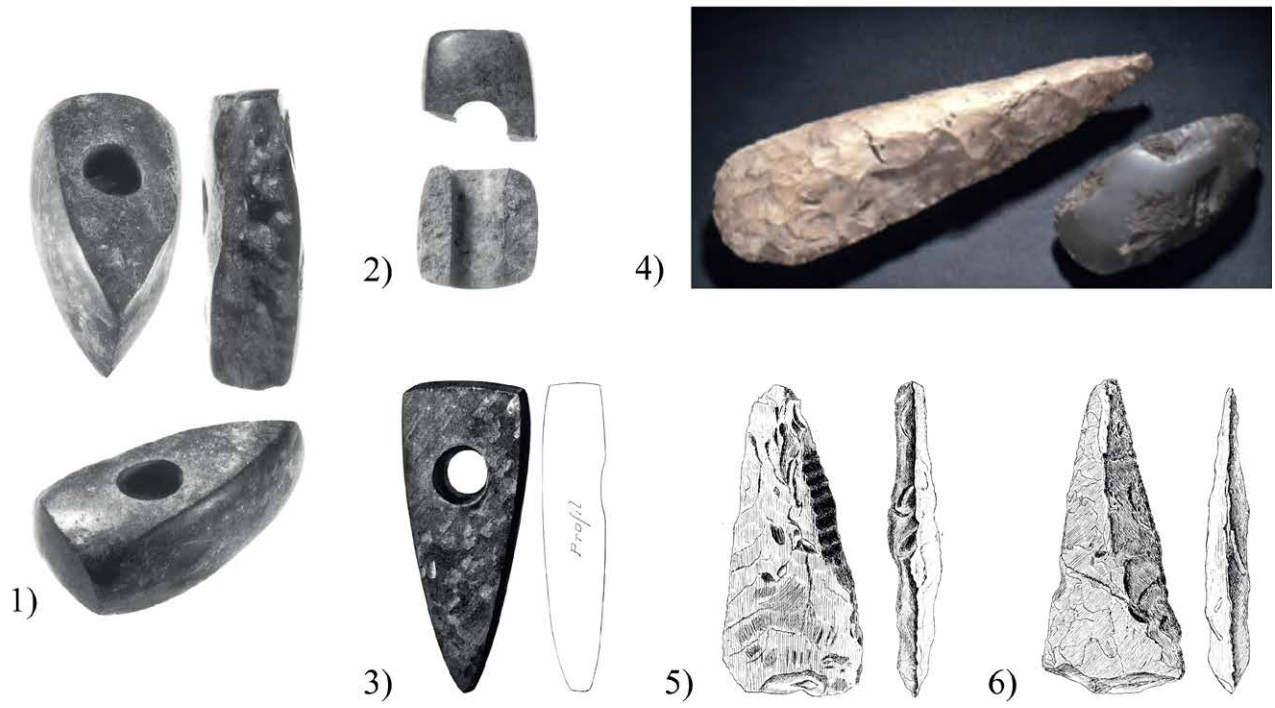


Figure 153: Selection of axe types (unknown scale). Perforated stone ax "Lochaxt": 1–2) Lenzburg, Goffersberg, 3) Pully, Chamblandes. Flint axe, Glis-Weisweil type: 4) Brig-Glis, Schönbiel, 5–6) Lausanne, Lutry (source: Wyss 1998, Schenk 1902, Loretan 2011).

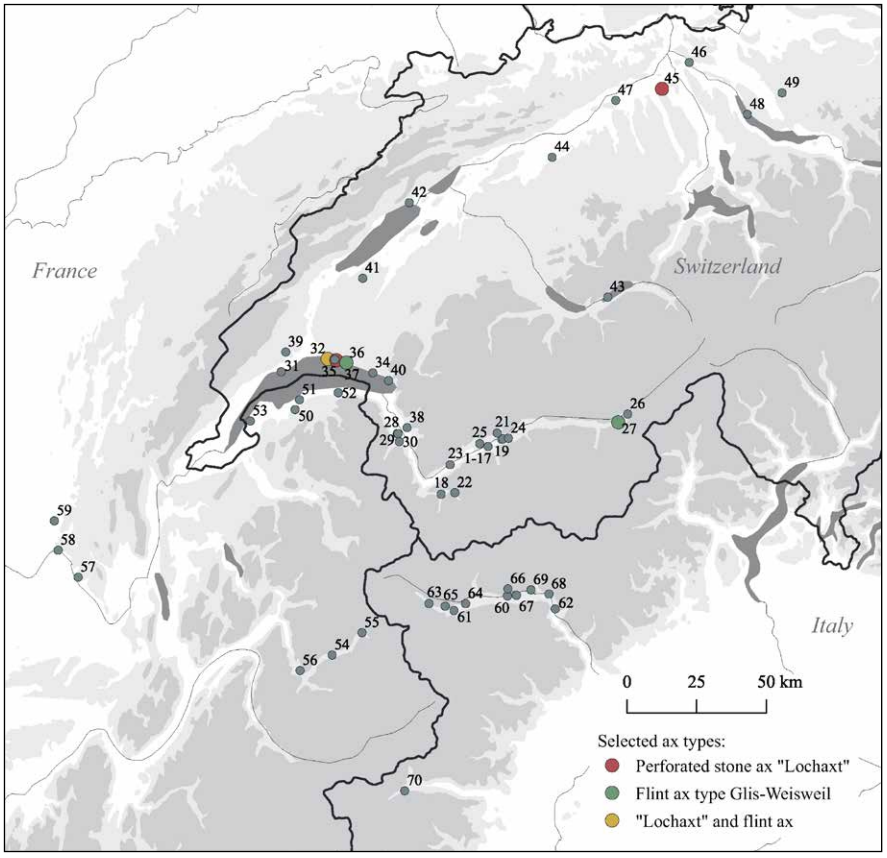


Figure 154: Map depicting the dispersion of perforated stone axes and flint axes within the sites.

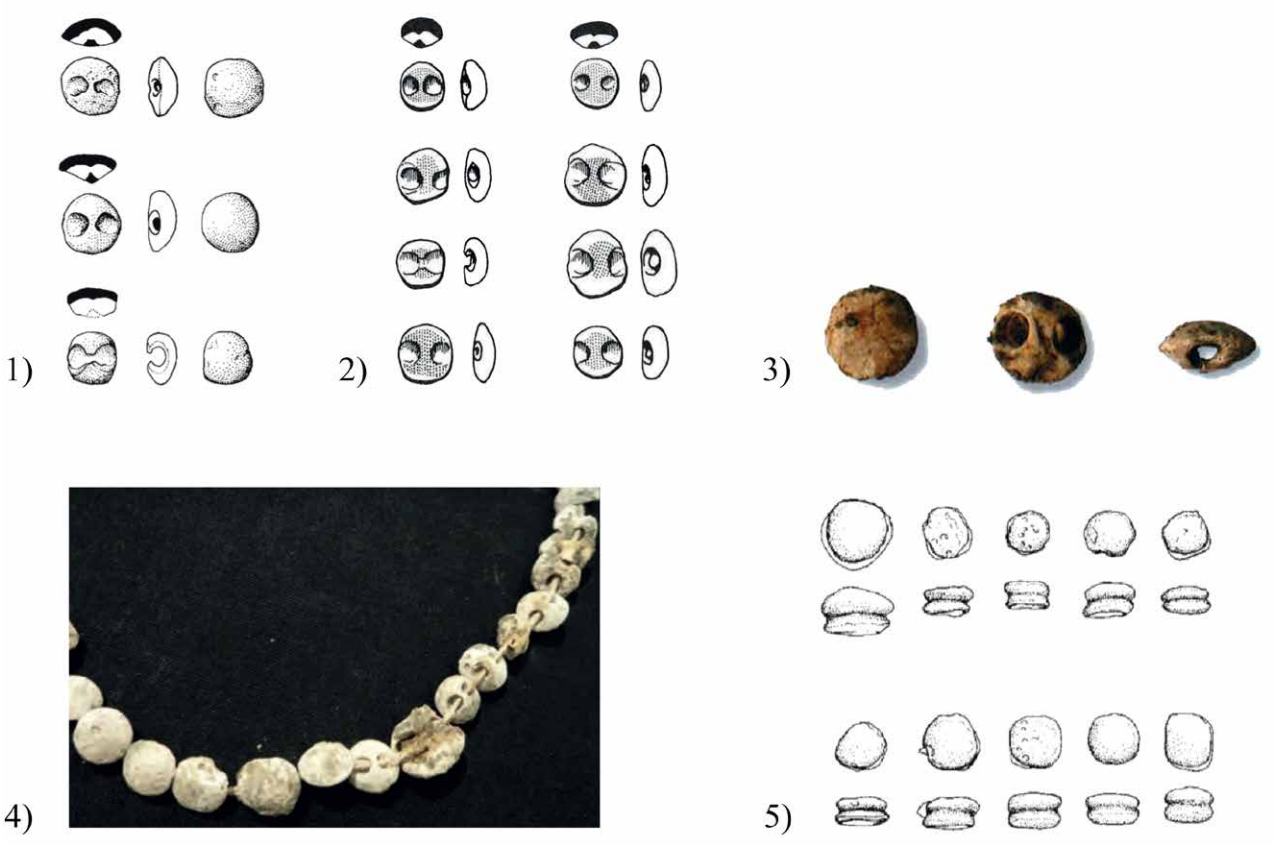


Figure 155: Selection of specific limestone beads/buttons (unknown scale). Glis-type buttons: 1) Thonon-les-Bains, Genevray, 2) Corseaux-sur-Vevey, En Seytion, 3) Saint-Léonard, MTA, 4) Brig-Glis, Schönbiel. Doppelknopf beads: 5) Thonon-les-Bains, Genevray (source: © Baudais et al. 2017, Baudais and Kramar 1990, Loretan 2011, Moinat and Chambon 2007).

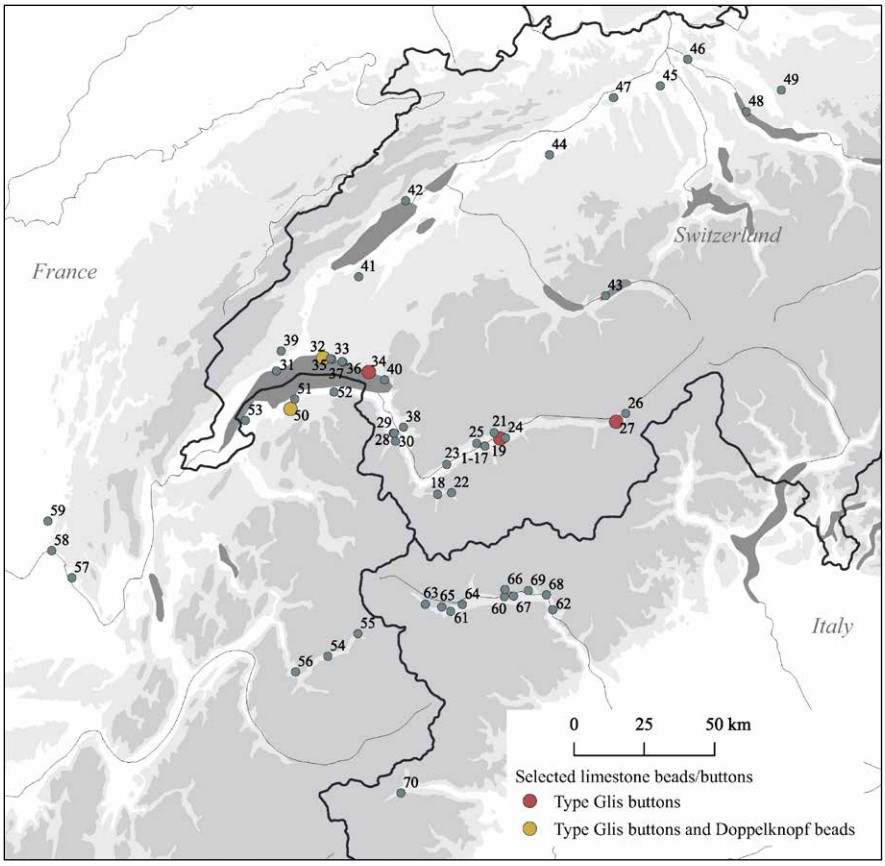


Figure 156: Map depicting the dispersion of Glis-type buttons and Doppelknopf beads within the sites.

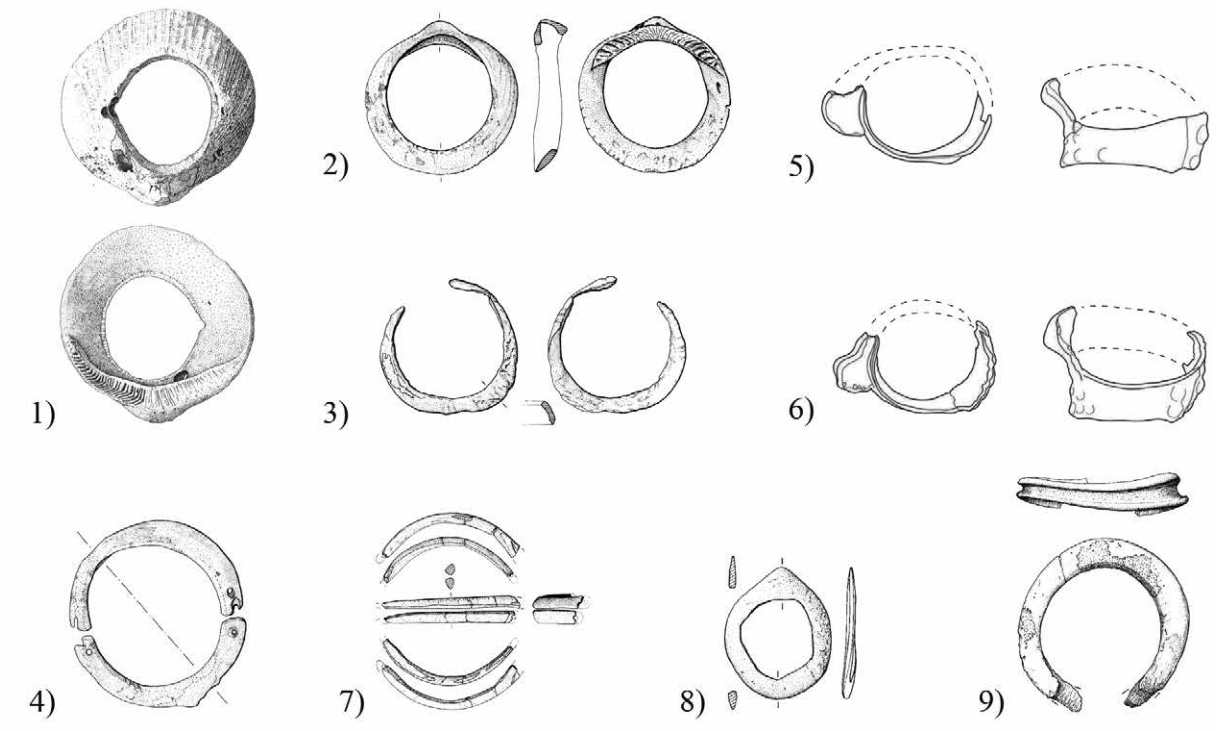


Figure 157: Selection of shell bracelets and likely imitations (unknown scale). Glycymeris shells: 1) Quart, Vollein, 2–3) Sion, Chemin-des-Collines, 4) Sion, Avenue-Ritz. Triton shells: 5) Saint-Léonard, MTA, 6) Saillon, Sous les Bercles. Likely imitations: 7) Sion, Chemin-des-Collines, 8–9) Thonon-les-Bains, Genevray (source: Mezzena 1997, Moinat et al. 2007, Moinat and Chambon 2007, © Baudais et al. 2017).

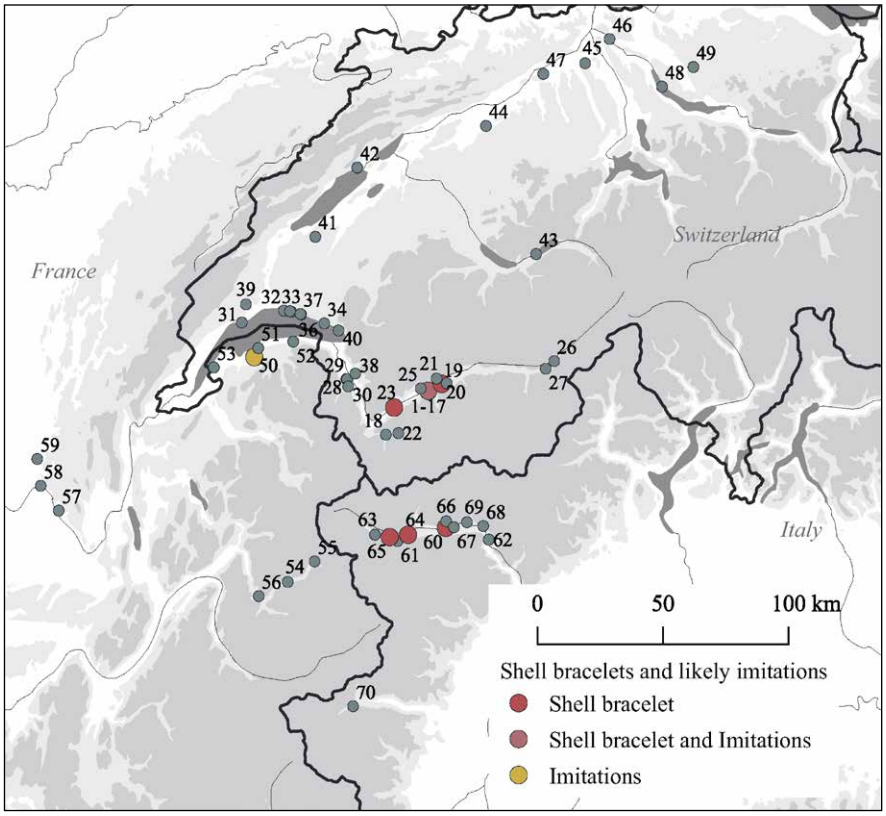


Figure 158: Map depicting the dispersion of Glycymeris and Triton shell bracelets, as well as likely imitations within the sites.

Switzerland), and a pit grave at Saint-Léonard, MTA (Figs. 157, 158) (Valais, Switzerland, Mariéthoz, 2007, 268–269, 2004, 392–393).

Given the marine origin of these shell objects, a vast area of circulation is to be expected. For example, in Northern Italy, shell bracelets are confirmed from the Early Neolithic Impresso "culture" to the Middle Neolithic Square Mouth Pottery (VBQ) "culture" (Micheli, 2012, 243). Similarly, Glycymeris bracelets date between the 6th and through the end of the 5th millennium BCE in the Balkans and Aegean region (Dimitrijević and Tripković, 2006, 247).

Likely imitations: Next to the mentioned Glycymeris (and Triton) shell bracelets, two rounded and perforated boar tusks were found on the site of Sion, Chemin-des-Collines. As they were found around the left humerus of a primary burial, an interpretation as a bracelet is likely (Moinat et al., 2007a, 293). In addition, two rounded sections of elk/moose antlers found within graves of the necropolis of Thonon-les-Bains, Genevray, were suggested to represent imitations of Glycymeris seashell bracelets (Figs. 157, 158) (Baudais et al., 2017, 156). Similar elk/moose antler bracelets can be found among the grave goods of the Hinkelsten and Rössen ceramic styles in southern Germany (Baudais, 2007, 172–173).

Furthermore, disc arm rings made of stone were found (Alpine jades and serpentinite greenstone). These circulated over long distances from central Italy to the Channel coast, starting in the late 6th and 5th millennium BCE, and it is assumed that the used raw material originated from the upper Rhine or Inner Alps (Pétrequin et al., 2019, 305–308). They appear to be completely missing within the examined zones of Western Alpine Neolithic cist graves.

7.3.5. Boar-tusk pectoral

These ornamental objects consist of 25 to 35 boar-tusk fragments arranged in two to three rows, one above the other. The individual boar tusks were cut longitudinally and the rounded ends were perforated. Use wear signs indicate that the pectorals were probably worn frequently and not just made for the burial ceremony (Moinat, 2003, 126–127).

Multiple pectorals were found within stone cists of Pully, Chamblandes, and one at the necropolis of Corseaux-sur-Vevey, En-Seyton. An additional boar tusk pectoral originates from a pit grave from Allaman, En-Vernex (Vaud, Switzerland; Moinat, 2008, 102–105). So far, these pectorals from the northern shore of Lake Geneva represent the only finds of sets of perforated boar tusks in the area under study (Figs. 159, 160) (Moinat, 2003, 128–129).

Figure 159: Selection of boar-tusk pectorals (unknown scale): 1) Corseaux-sur-Vevey, En Seytion, 2) Pully, Chamblandes, 3) Allaman, En-Vernex (source: Moinat 2008, © Moinat 2003, Baudais and Kramar 1990).

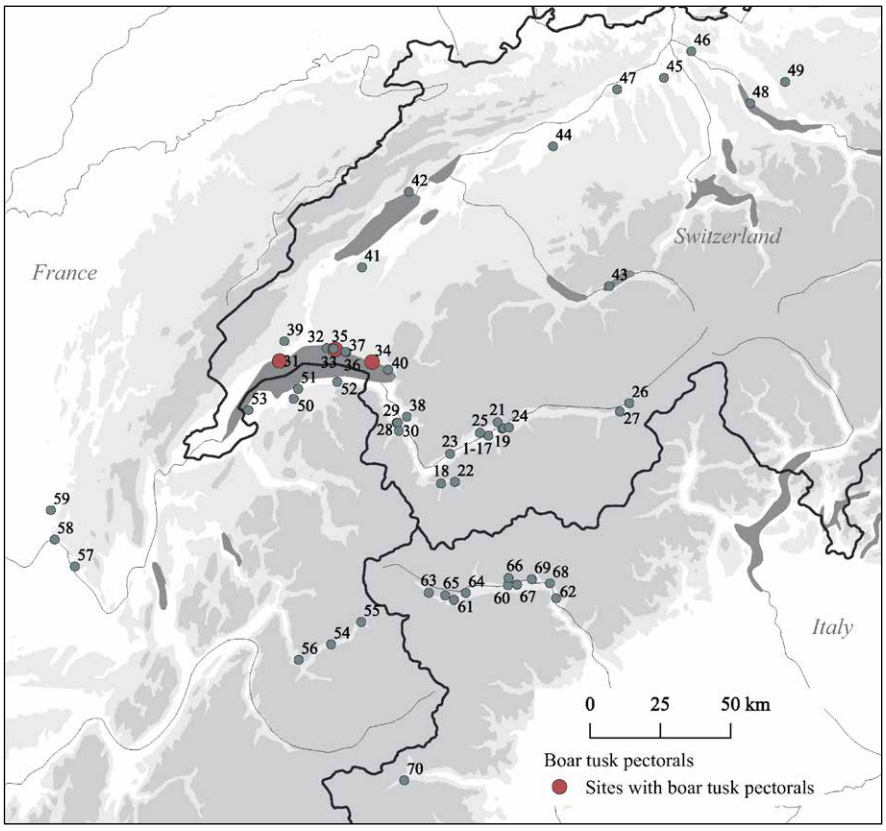


Figure 160: Map depicting the dispersion of boar-tusk pectorals within the sites.

Discussion of results 8

This chapter will initially assess the origin and spread of Neolithic cist graves in the areas under study (Chapter 8.1). Afterwards, the evolution of the burial practices will be discussed (Chapter 8.2), and finally, aspects of the grave goods, specifically their relation to burial practices, regionality, and chronology are covered (Chapter 8.3).

8.1. Chronology and spread of Western Alpine cist graves

In this subchapter, the combined results of the previous and new radiocarbon data of human remains will be discussed (Chapter 8.1.1). Additionally, some aspects potentially affecting the radiocarbon dates, such as the freshwater reservoir effect and slow carbon turnover of petrous bone samples, are addressed (Chapter 8.1.2). Finally, based on the radiocarbon data, the emergence and spread of Neolithic cist graves within the area under study will be exemplified (Chapter 8.1.3).

8.1.1. Discussion of radiocarbon results

Of the analysed sites, 121 radiocarbon dates were available previous to this study (Chapter 5.1). Of these, 21 were rejected due to high uncertainty ranges (over ± 65 years) or reportedly bad collagen preservation. This resulted in a total of 100 radiocarbon dates used for the chronological assessment in the current study. Additional quality control indicators (e.g. C/N ratio or collagen yield; see Chapter 5.3) were not available for these dates.

In addition, 128 bone samples were extracted and analysed in the context of this research (Chapter 5.2. and 5.3). Of these, 39 yielded invalid results (either they did not yield any collagen or did not meet the quality control criteria). Additionally, four valid results were discarded, as they dated to Late Antiquity and have originated from mixed contexts. In addition, ten samples from the Upper Rhône Valley were dated twice. This resulted in a total of 95 new AMS radiocarbon dates (Chapter 5.4). Combining this new dataset with the previously available dates, a total of 195 radiocarbon dates are available to discuss the chronology of Western Alpine Neolithic cist graves.

Next to doubling the number of currently available radiocarbon dates, the ones carried out within the context of this research project have uncertainty ranges with an average of only ± 27.4 years, in contrast to an average range of ± 47.1 years for previously available radiocarbon dates. These significantly lower uncertainties result in shorter calibrated age ranges, making them extra valuable for this study.

Previous hypotheses placed the stone cist graves from the Aosta Valley in the Late Neolithic, or even the Bronze Age (Mezzena, 1997, 62). The new data, especially those from Villeneuve, allow for the substantial revision of these estimates, pointing instead to an earlier chronology. The Bayesian results based on an overlapping phase model (Fig. 161, A_{model} = 84.2, $A_{overall}$ = 80.5) frame the burial activity within the Villeneuve necropolis to 4785–4555 cal. BCE (95.4%), and within the Vollein site to 4555–4305 cal. BCE

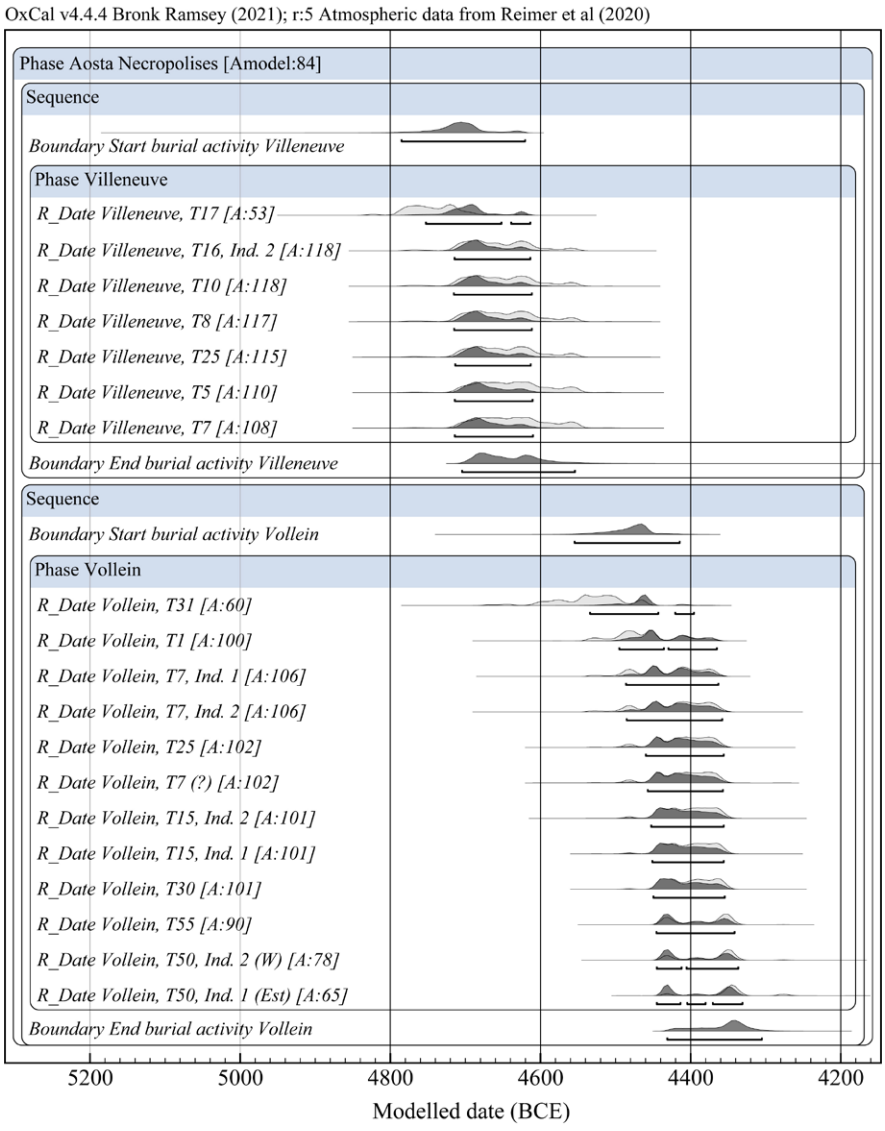

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Aosta Necropolises [Amodel:84]
Sequence
Boundary Start burial activity Villeneuve
Phase Villeneuve
R_Date Villeneuve, T17 [A:53]
R_Date Villeneuve, T16, Ind. 2 [A:118]
R_Date Villeneuve, T10 [A:118]
R_Date Villeneuve, T8 [A:117]
R_Date Villeneuve, T25 [A:115]
R_Date Villeneuve, T5 [A:110]
R_Date Villeneuve, T7 [A:108]
Boundary End burial activity Villeneuve
Sequence
Boundary Start burial activity Vollein
Phase Vollein
R_Date Vollein, T31 [A:60]
R_Date Vollein, T1 [A:100]
R_Date Vollein, T7, Ind. 1 [A:106]
R_Date Vollein, T7, Ind. 2 [A:106]
R_Date Vollein, T25 [A:102]
R_Date Vollein, T7 (?) [A:102]
R_Date Vollein, T15, Ind. 2 [A:101]
R_Date Vollein, T15, Ind. 1 [A:101]
R_Date Vollein, T30 [A:101]
R_Date Vollein, T55 [A:90]
R_Date Vollein, T50, Ind. 2 (W) [A:78]
R_Date Vollein, T50, Ind. 1 (Est) [A:65]
Boundary End burial activity Vollein
5200
5000
4800
4600
4400
4200
Modelled date (BCE)

Figure 161: Independent bounded phase model of 14C dates from the two necropolises of the Aosta Valley using Oxcal 4.4.4 software (source: Steuri et al. 2023).

(95.4%). This result is of special interest, since it places the finds from the Aosta Valley among the oldest Chamblandes-type graves ever discovered. In addition, two individuals from the isolated grave of La Salle, Derby, appear to have lived in the first half of the 5th millennium BCE, dating between the two larger necropolises (Fig. 145).

Regarding the two sites in the Tarentaise Valley, a single date from Bourg-Saint-Maurice, Le Châtelard, indicates burials starting in the 48th century BCE. Few data (n = 3) are available so far from this site, and their calibrated ranges spread until ca. 4350 BCE. Unfortunately, the dates from Aime, le Replat, have higher uncertainty ranges (averaging ± 58.3 years), and spread over the period of 4600–4250 BCE. In addition, the data indicate single and collective burials used contemporarily during this time.

In the Upper Rhône Valley, at least two radiocarbon dates from Sion, Sous-le-Scex, point to burial activity in the first half of the 5th millennium BCE. Due to the high uncertainty ranges of the dates from this site, they spread over a long period of 4700–3800/3650 BCE. Interestingly, the radiocarbon data series from the site of Sion, Remparts, clearly show that graves containing the remains of one single individual are from an older usage phase of the necropolis than the dates from the collective graves. Bayesian results based on an overlapping phase model (Figs. 162 and 163, A_{model} = 98.6, $A_{overall}$ = 88.9) frame the burial activity within single-use graves to 4579–4289 cal BCE (95.4%) and within collective

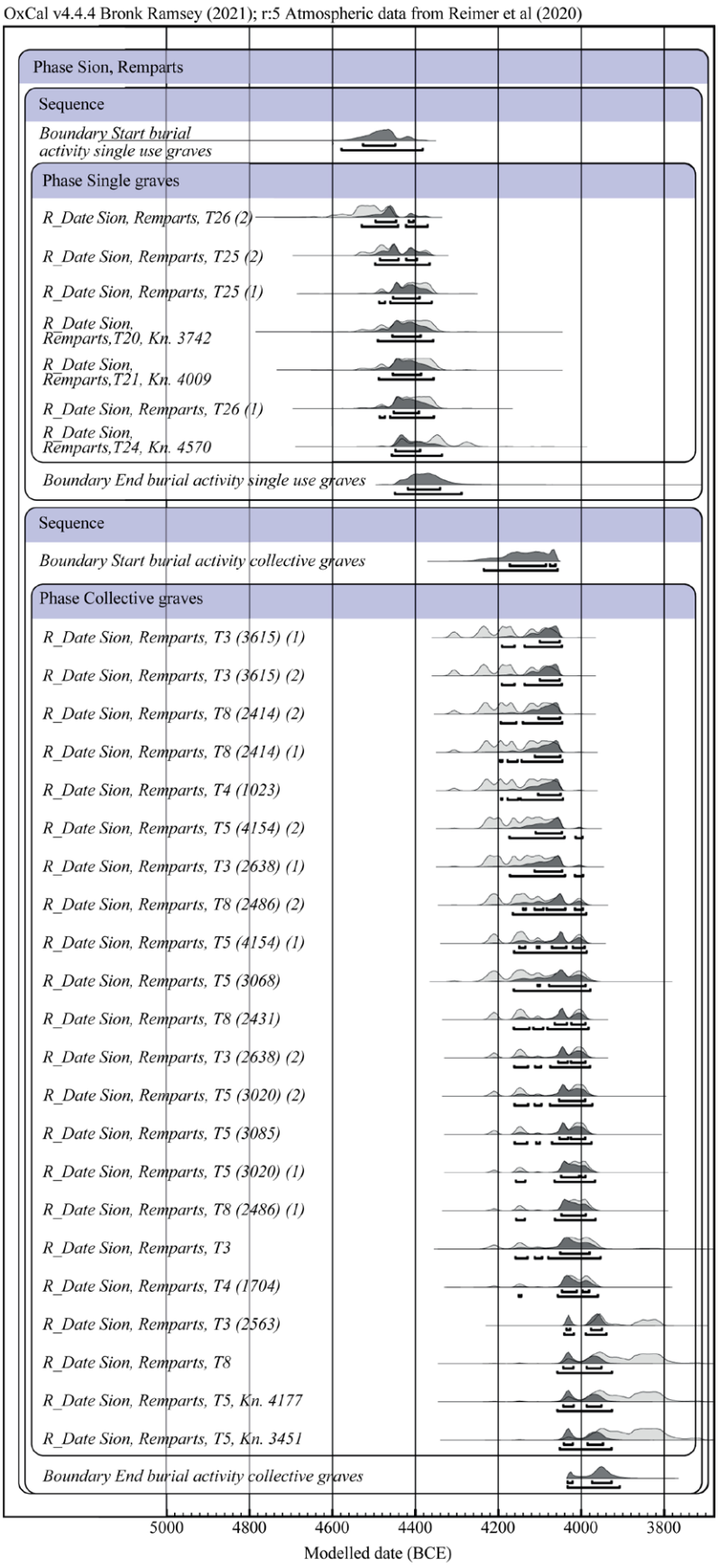

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Sion, Remparts
Sequence
Boundary Start burial activity single use graves
Phase Single graves
R_Date Sion, Remparts, T26 (2)
R_Date Sion, Remparts, T25 (2)
R_Date Sion, Remparts, T25 (1)
R_Date Sion, Remparts,T20, Kn. 3742
R_Date Sion, Remparts,T21, Kn. 4009
R_Date Sion, Remparts, T26 (1)
R_Date Sion, Remparts,T24, Kn. 4570
Boundary End burial activity single use graves
Sequence
Boundary Start burial activity collective graves
Phase Collective graves
R_Date Sion, Remparts, T3 (3615) (1)
R_Date Sion, Remparts, T3 (3615) (2)
R_Date Sion, Remparts, T8 (2414) (2)
R_Date Sion, Remparts, T8 (2414) (1)
R_Date Sion, Remparts, T4 (1023)
R_Date Sion, Remparts, T5 (4154) (2)
R_Date Sion, Remparts, T3 (2638) (1)
R_Date Sion, Remparts, T8 (2486) (2)
R_Date Sion, Remparts, T5 (4154) (1)
R_Date Sion, Remparts, T5 (3068)
R_Date Sion, Remparts, T8 (2431)
R_Date Sion, Remparts, T3 (2638) (2)
R_Date Sion, Remparts, T5 (3020) (2)
R_Date Sion, Remparts, T5 (3085)
R_Date Sion, Remparts, T5 (3020) (1)
R_Date Sion, Remparts, T8 (2486) (1)
R_Date Sion, Remparts, T3
R_Date Sion, Remparts, T4 (1704)
R_Date Sion, Remparts, T3 (2563)
R_Date Sion, Remparts, T8
R_Date Sion, Remparts, T5, Kn. 4177
R_Date Sion, Remparts, T5, Kn. 3451
Boundary End burial activity collective graves
5000
4800
4600
4400
4200
4000
3800
Modelled date (BCE)

Figure 162: Independent bounded phase model of 14C dates from the necropolis of Sion, Remparts, using Oxcal 4.4.4 software.

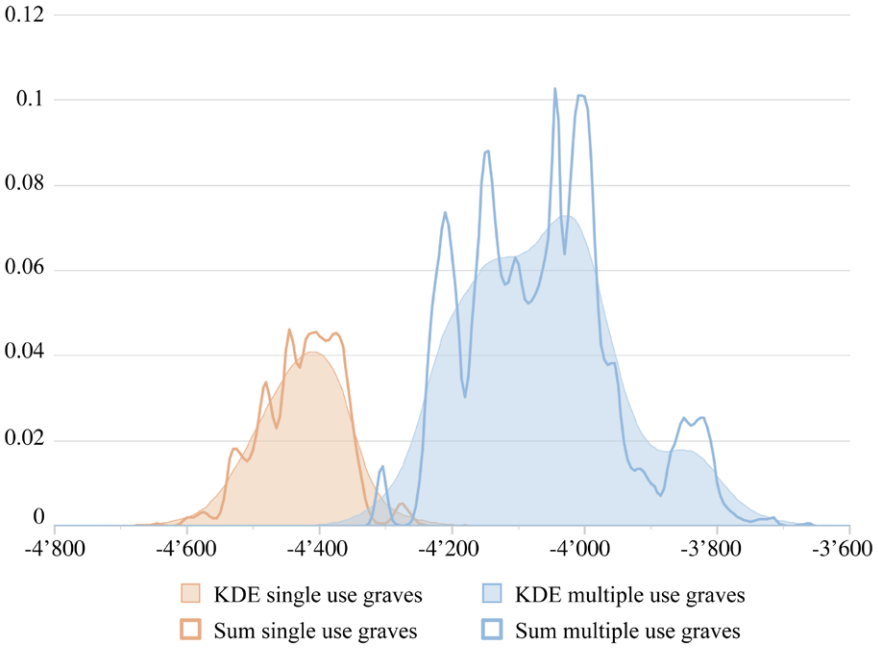


Figure 163: Considered radiocarbon dates (n = 29) from Sion, Remparts, separated by assumed use of the graves displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software.

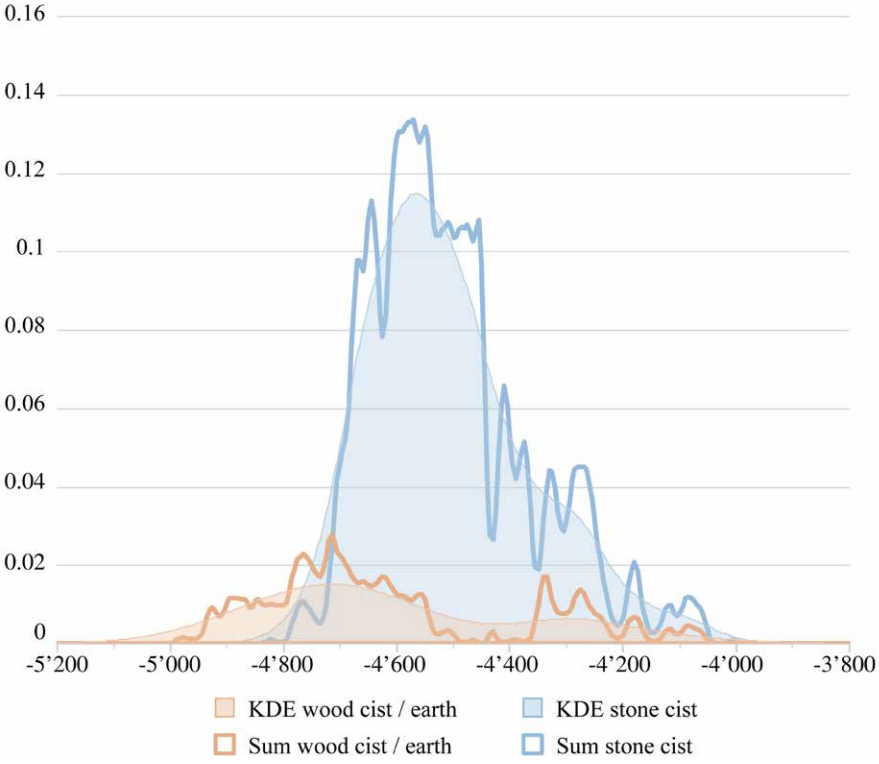


Figure 164: Considered radiocarbon dates (n = 46) from Thonon-les-Bains, Genevray, separated by grave architecture displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software.

graves to 4236–3908 cal BCE (95.4%). In addition, the few radiocarbon dates from burials of the sites of Saint-Léonard, Les-Bâtiments; Sion, Montorge; and Sion, Sous-le-Scex, indicate collective burials appearing only around the last quarter of the 5th millennium BCE in the Upper Rhône Valley.

The vast necropolis of Genevray was a focal point regarding the chronological assessment of the Western Alpine Neolithic cist graves. A total of 54 radiocarbon dates are now available, consisting of the initial set from 37 graves and 17 additional dates (from individuals of the same graves). Therefore, at least one valid radiocarbon date

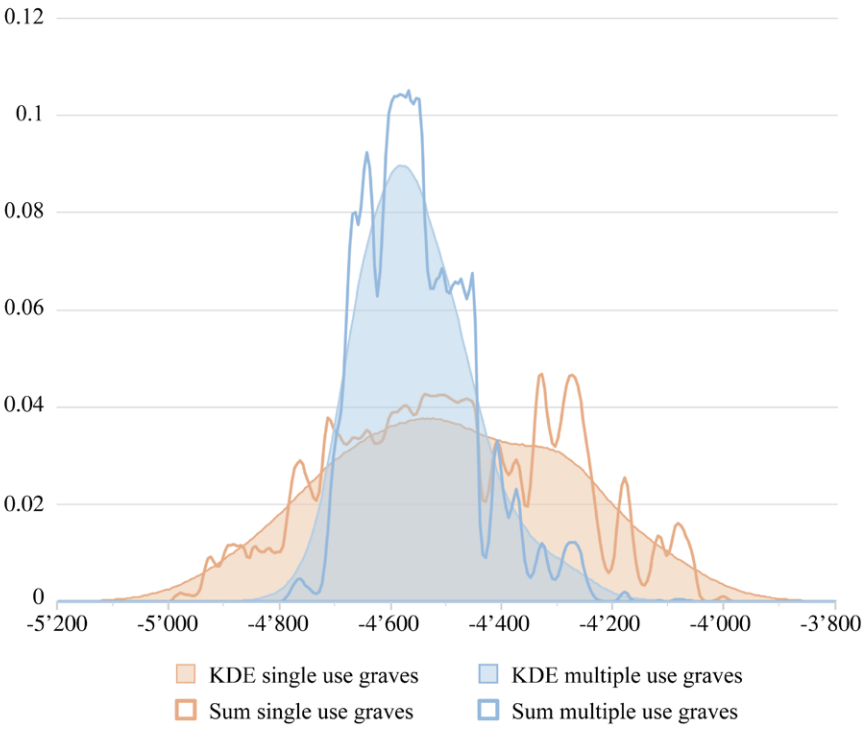


Figure 165: Considered radiocarbon dates (n = 46) from Thonon-les-Bains, Genevray, separated by assumed use of the grave displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software.

is available for 54% of the anthropologically analysed graves of this site. One needs to keep in mind that the average uncertainty ranges of the previously available dates are noticeably higher (± 43 years vs. ± 24.7 years).

The data reveal interesting results regarding the chronology of used grave architecture. The previously available radiocarbon dates have suggested the start of burial activity within stone cist graves occurring after 4800 BCE. The redating of some individuals can only confirm burials within stone cists starting around 4700 BCE. In contrast, the redating of individuals buried in graves without stone construction points to them being significantly older, starting as far back as 5000 BCE. The two models in Figs. 164 and 165 display overlapping plots of the dates (dating to the 5th millennium BCE). This shows stone cists and wooden cists/pit graves occurring next to each other after 4800 BCE until the end of the 5th millennium BCE (Fig. 164). In contrast, Fig. 165 indicates that graves with multiple, identifiable usage periods were only in use for around five to six centuries. Combined, both models show a spike, indicating the correlation between the use of stone cists and multiple usage of graves between 4700 and 4500 BCE.

The redating of individuals from the same graves proves burial activities within stone cists took place during significantly younger periods in the 4th and 3rd millennium BCE. In addition, multiple dates are now available from different individuals of three collective graves (T69, T86 and T1005). For the first time, they confirm up to three usage periods and burial activities, spanning multiple centuries for individual stone cist graves between 4700 and 4200 BCE (Fig. 166).

Regarding the sites on the northern shore of Lake Geneva, the focus was on the necropolis of Corseaux-sur-Vevey, En-Seyton. A valid radiocarbon date is available for almost a third (31.3%) of all the individuals from this site. The new series of dates frame the burial activity mainly between 4500 and 4250 BCE, proving that the necropolis is at least 500 years older than previously assumed.

Fewer radiocarbon dates (with higher uncertainty ratios) are available for the two necropolises of Lausanne, Vidy, and Pully, Chamblandes. The data place the burial activity mainly in the second half of the 5th millennium BCE (4550–3800 BCE for Vidy

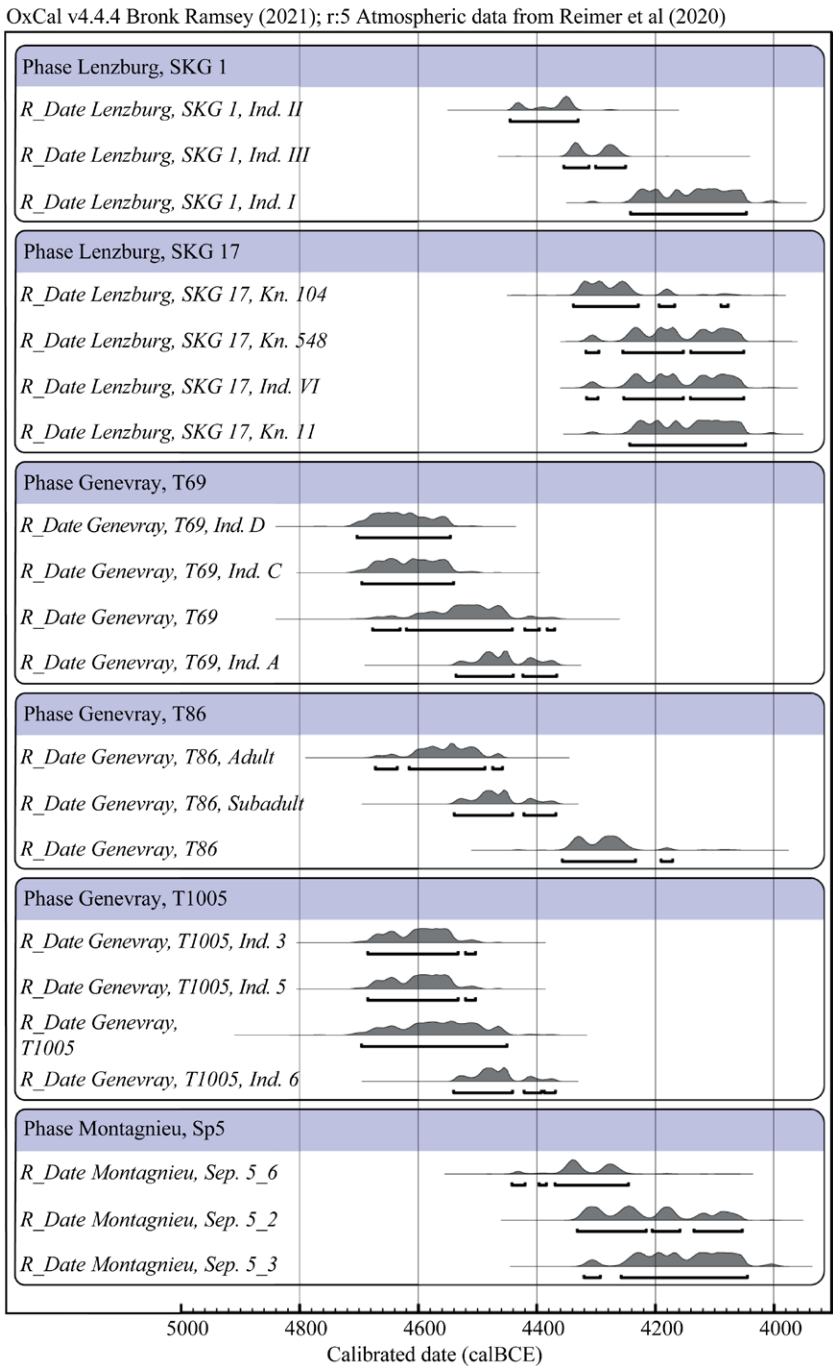

OxCal v4.4.4 Bronk Ramsey (2021); r:5 Atmospheric data from Reimer et al (2020)
Phase Lenzburg, SKG 1
R_Date Lenzburg, SKG 1, Ind. II
R_Date Lenzburg, SKG 1, Ind. III
R_Date Lenzburg, SKG 1, Ind. 1
Phase Lenzburg, SKG 17
R_Date Lenzburg, SKG 17, Kn. 104
R_Date Lenzburg, SKG 17, Kn. 548
R_Date Lenzburg, SKG 17, Ind. VI
R_Date Lenzburg, SKG 17, Kn. 11
Phase Genevray, T69
R_Date Genevray, T69, Ind. D
R_Date Genevray, T69, Ind. C
R_Date Genevray, T69
R_Date Genevray, T69, Ind. A
Phase Genevray, T86
R_Date Genevray, T86, Adult
R_Date Genevray, T86, Subadult
R_Date Genevray, T86
Phase Genevray, T1005
R_Date Genevray, T1005, Ind. 3
R_Date Genevray, T1005, Ind. 5
R_Date Genevray, T1005
R_Date Genevray, T1005, Ind. 6
Phase Montagnieu, Sp5
R_Date Montagnieu, Sep. 5_6
R_Date Montagnieu, Sep. 5_2
R_Date Montagnieu, Sep. 5_3
5000
4800
4600
4400
4200
4000
Calibrated date (calBCE)

Figure 166: Calendar ages of selected collective stone cist graves showing burial activity using Oxcal 4.4.4 software.

and 4350–4000 BCE for Chamblandes). Similarly to the site of Genevray, two radiocarbon dates indicate younger usage periods in the second half of the 4th millennium BCE at Lausanne, Vidy. In addition, both grave architectures and all mentioned burial practices appear to have been occurring simultaneously at this site.

The analysis of bone samples from the necropolis of Lenzburg, Goffersberg, revealed interesting results regarding the usage period(s) of collective stone cists. Six radiocarbon dates with high uncertainty ranges (of ± 60–65 years) were available previous to this study. They indicated the burial activity of the stone cists to have taken place between 4450 and 4000 BCE, while the funerary monument appears to be from a different period in the 4th millennium BCE. The 13 new radiocarbon dates, originating from almost half of the total of 16 stone cists (n = 7), confirm the period of use of stone

cists during the second half of the 5th millennium BCE. For two collective graves, multiple dates (>2) are now available; the samples of three individuals from grave SKG 1 indicate three usage periods between 4450 and 4050 BCE. In contrast, the four dates from SKG 17 are relatively uniform and point to one single phase (Fig. 166).

Similar to those of the previous site, the 11 radiocarbon dates of bone samples from Montagnieu, Grotte-du-Souhait, frame the burial activity between 4450 and 4050 BCE. Of special interest are the results of two collective burials showing different burial practices: three primary burials were placed within Sp6, and their radiocarbon dates imply that they were probably contemporaneous. In contrast, it appears that the primary burials found on the grave floor of Sp5 could be younger than the commingled bones placed on top of them, providing further evidence for the secondary burial practice of collecting (older) remains and placing them within "occupied" stone cists (Fig. 166).

8.1.2. Aspects potentially affecting the radiocarbon dates

Exploratory check for freshwater reservoir effect: To check for a possible freshwater reservoir effect (FRE) on the radiocarbon dates generated in the context of this research project, a preliminary analysis of stable isotopic ratios of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) on a subset of bone samples was carried out. They consist of seven individuals from three sites in the Aosta Valley: three from Villeneuve and Vollein, and one from Derby (Steuri et al., 2023).

Isotope ratios were measured by isotope ratio mass spectrometry (IRMS) at Isolab GmbH, Schweitenkirchen, Germany, using an average of three measurements per sample. Results are reported in δ-notation as units per mill (‰) according to the international standards of Vienna Pee Dee Belemnite (V-PDB) for carbon and Ambient Inhalable Reservoir (AIR) for nitrogen. Moreover, the laboratory internal standards STD R (collagen from cowhide from the EU project TRACE) and STD BRA (collagen from Brazilian cowhide) were used. Internal analytical errors were recorded as ±0.1‰ for $\delta^{13}C$, and ±0.2‰ for $\delta^{15}N$ (standard error of the means calculated from 3 or 4 measurements).

Isotopic ratios were first explored visually and subsequently included in Bayesian models of dietary composition using FRUITS (Fernandes et al., 2014). Faunal and paleobotanical samples are, at present, not available from the analysed contexts. Therefore, the model was computed with no priors and using as proxies published isotopic values from Bronze Age Western Switzerland (Varalli et al., 2021) for C_3, plants, terrestrial herbivores, and freshwater fish, and, for C plants, the values estimated by Knipper et al. (2017).

Preliminary results and explorative analysis of stable isotopes of carbon and nitrogen: Figure 167 shows the isotopic values of the seven human samples. All samples fit the quality criteria. Stable carbon and nitrogen isotopic ratios range from –19.43 to –19.99 (average: –19.69 ± 0.15) and from 9.17 to 10.64 (average: 9.75 ± 0.47), respectively. Figure 168 illustrates the results of the Bayesian modelling of dietary composition. These are consistent with a mixed diet, including C_3 plant products and terrestrial animal proteins. Conversely, the exploitation of freshwater food resources seems, at least in the analysed sample, minimal.

Based on this preliminary analysis of stable carbon and nitrogen isotopic ratios, a freshwater reservoir effect seems unlikely for the seven analysed specimens. Naturally, these estimates need, in any case, to consider three important caveats: a) the small size of the analysed sample (representing only 7% of the total number of valid dates); b) the lack of faunal samples from the analysed sites in the Aosta Valley, strongly limiting the interpretation; and c) freshwater food webs vary greatly in stable carbon and nitrogen isotope ratios depending on the species and the species values show large standard deviations (e.g. Bösl et al., 2006).

These three reasons combined make it difficult to estimate a potential freshwater reservoir effect. The preliminary data of the isotope analysis of these samples suggest that the proportion of freshwater fish was quite low and, accordingly, unlikely to have influenced the radiocarbon data. Given the location of the Western Alpine Neolithic

Individual	Age (y)	Sex	$\delta^{13}C$ [‰]$_{V\text{-}PDB}$	$\delta^{15}N$ [‰]$_{AIR}$	%C	%N	molar C/N
Villeneuve T4	≥ 50	M	-19.99	9.72	36.70	13.30	3.22
Villeneuve T7	≥ 50	F	-19.84	9.38	40.80	14.90	3.19
Villeneuve T16.2	35-49	M	-19.65	9.17	39.90	14.50	3.21
Vollein T7.2	≥ 50	M	-19.43	10.64	39.60	14.20	3.25
Vollein T25	10±2.5	NA	-19.63	9.57	39.70	14.30	3.24
Vollein T31	≥ 50	F	-19.5	9.9	39.60	14.40	3.21
Derby Ind. 2	20-34	F	-19.79	9.84	35.10	12.60	3.25
N			*7*	*7*			
Mean			*-19.69*	*9.75*			
SD			*0.15*	*0.47*			

Figure 167: Stable isotope ratios of carbon and nitrogen from bone collagen of the seven analysed individuals (source: Steuri et al. 2023).

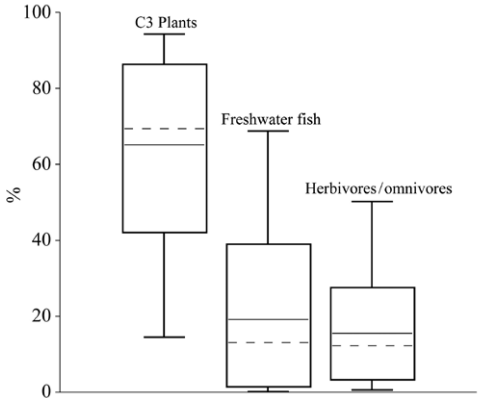


Figure 168: Estimates of dietary composition based on the average δ13C and δ15N values from human bone collagen. Horizontal continuous and dashed lines show the mean and median values, respectively (source: Steuri et al. 2023).

cist graves (the nearest coastline is some 250 km away), it can additionally be assumed that the dietary exploitation of marine resources was quite unlikely in prehistoric times. Therefore, it was not considered.

Slow carbon turnover of petrous bone samples: A majority of the analysed samples in the context of this research originate from different long bones, mostly the femur or humerus. Regarding the samples from the Aosta Valley, petrous bones were almost exclusively investigated. These bones were selected for the sake of collagen preservation. Generally, they do not allow the determination of the time of death directly due to a slow carbon turnover, which typically results in radiocarbon ages of the bones that are a few decades earlier than the date of the death (Indara et al., 2022; Meadows et al., 2020). As the petrous bone is already formed in early childhood (Jørkov et al., 2009; Meadows et al., 2020), this offset may even be a few decades larger than for both other skull parts or long bones, which should be considered for the comparison of the results from the Aosta Valley with results from the other sites. As the modelled age ranges span about a century, however, this possible difference of a few decades is regarded as negligible (Steuri et al., 2023).

8.1.3. Modelling the emergence and spread of Neolithic cist graves

To assess the chronology of Neolithic cist graves in the Western Alpine region, the focus will be on assessed sites with at least three valid radiocarbon dates from three graves. Figure 169 lists the assessed Neolithic stone cist sites in the Western Alpine region featuring radiocarbon data from multiple graves. The considered radiocarbon dates (n = 186) were modelled in independent bounded phases (A_{model} = 83.2, $A_{overall}$ = 96). Figure 169 shows the KDE plots ordered by their respective median to visualise the likely period of use for these necropolises.

From this overview, it appears that three sites present the oldest radiocarbon ages, namely Villeneuve, Champ Rotard, Bourg-Saint-Maurice, Le Châtelard, and Thonon-les-Bains, Genevray. Overall, the data point to a rather contemporary emergence of the use

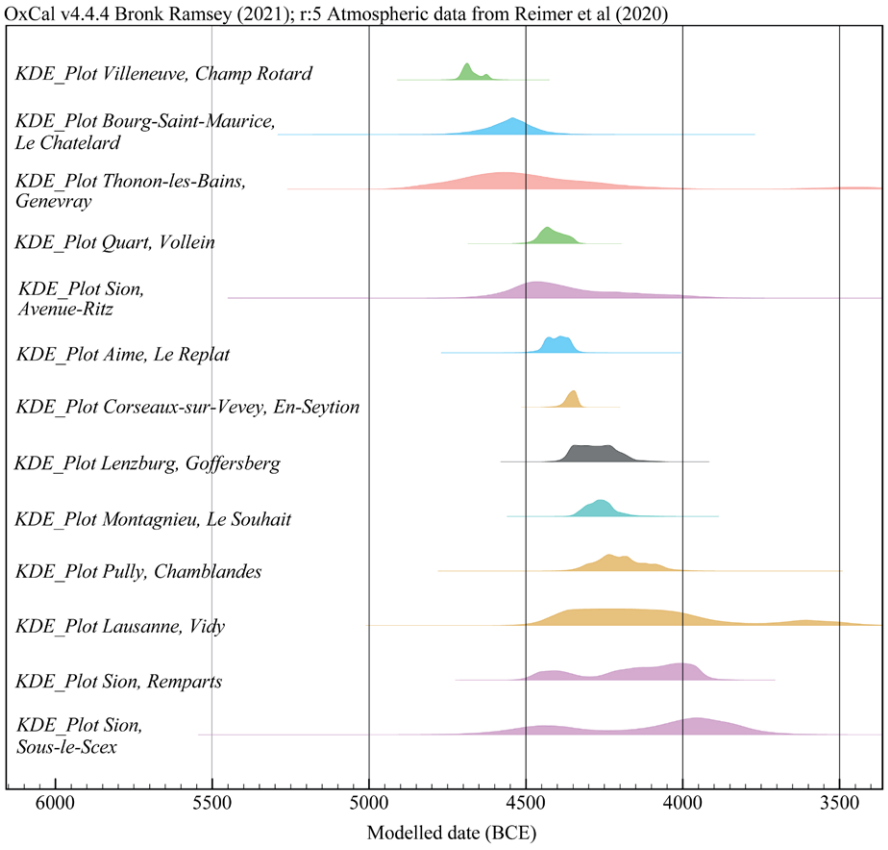


Figure 169: KDE plots derived from an independent bounded phase model of the radiocarbon dates (n = 186) from considered sites, ordered by their respective median using Oxcal 4.4.4 software. The colours refer to the geographical zones (Green: Aosta Valley, Blue: Tarentaise Valley, Purple: Upper Rhône Valley, Red: Lake Geneva South, Orange: Lake Geneva North, Grey: Swiss Plateau, Teal: Bugey).

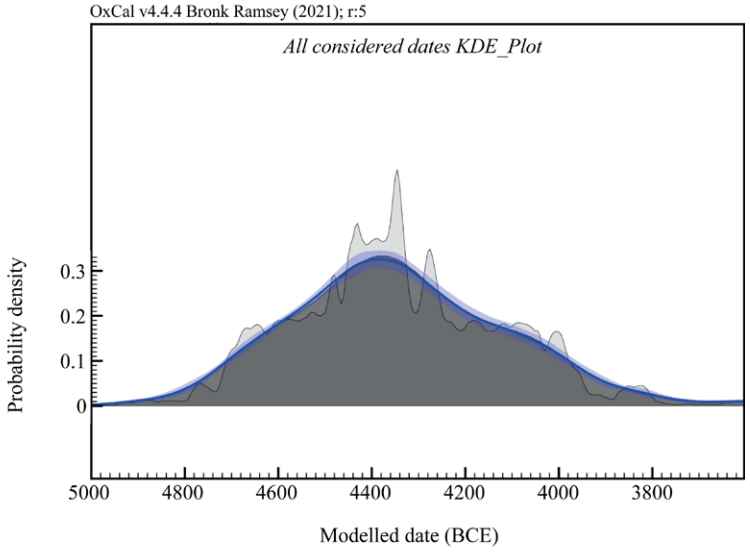


Figure 170: KDE plot of radiocarbon dates (n = 186) from considered sites (Figure 169) modelled into one single phase using Oxcal 4.4.4 software.

of cist burials, both on the southern shore of Lake Geneva and the Aosta and Tarentaise valleys, starting at around 4800 BCE. However, few data from Bourg-Saint-Maurice, Le Châtelard, are available so far. In addition, at least one date from the site of Sion, Sous-le-Scex, indicates burials starting during the 48th century BCE. It exhibits a high uncertainty range of ± 65 years, resulting in a modelled median date of 4510 cal. BCE. Similarly, the new dates from Sion, Avenue Ritz, point to the usage of stone cist graves emerging after 4600 BCE in the Upper Rhône Valley.

Figure 169 further indicates the wider interregional spread of cist graves north, northeast, and west, occurring only after 4500 BCE; specifically, to the northern shore of Lake Geneva (Corseaux-sur-Vevey, Pully, Chamblandes, and Lausanne, Vidy), the Swiss Plateau (Lenzburg, Goffersberg), and the Bugey (Montagnieu, Le Souhait).

Moreover, the data from the sites of Quart, Vollein, and Aime, Le Replat, show that the use of stone cist graves for burials in the Aosta and Tarentaise valleys ceased around 4300 BCE. This is earlier than in neighbouring areas of the Upper Rhône Valley or Lake Geneva, where the demise of this grave type can be placed around 4000/3800 BCE. Moreover, isolated burials from the late 4th or 3rd millennium BCE (identified within the sites of Thonon-les-Bains, Genevray, and Lausanne, Vidy) indicate the sporadic reuse of stone cist graves in younger periods, an interesting phenomenon that deserves further investigation (see Chapter 10).

To sum up, if all considered radiocarbon dates (n = 186) are combined into one phase, the overall use of cist graves in the Western Alps took place mainly between 4800 and 3800 BCE (Fig. 170). The spike after 4500 BCE signifies a higher density of dates and indicates the wider spread of burials within cist graves. Strikingly, we see a decline in probability density occurring after 4250 BCE and a sharp drop at 4000 BCE.

8.2. Evolution of burial practices within Western Alpine cist graves

With the established chronology in mind, this subchapter focuses on specific elements of burial practices and how they evolved (refer to Table 5 to follow the assessments below).

The placement of the sites appears to have generally been determined by the specific regions or geographic zones in which they were found. In the inner Alpine valleys, they were placed on plateaus or river terraces. Around Lake Geneva, the sites were in close vicinity to the shores. In addition, the stone cist graves on the Swiss Plateau appear to have been close to important waterways. This indicates that the choice of location of the necropolises may have been made under the aspects of visibility in the terrain or the control of trade routes and resources. The proximity to the communication axes may also indicate a high mobility and transalpine exchange of these prehistoric societies. Further research in regards to the placement of necropolises would be desirable, especially considering symbolic aspects, the local topography, and the relation to settlements and resources.

As the reported number of graves per site and extent of necropolises are dependent on multiple variables (e.g. state of research or extent of excavations), these aspects are difficult to consider when discussing burial practices and spatial organisation of necropolises. Even with these reservations in mind, the distinctive nature of the site of Thonon-les-Bains, Genevray, with well over 200 located graves, seems out of the question. This is further highlighted by the radiocarbon data indicating continuous burial activity for well over a millennium. So far, the only necropolis of possibly similar extent and utilisation time is Lausanne, Vidy (and potentially Pully, Chamblandes).

In contrast, with the exception of the necropolis of Quart, Vollein (66 reported graves), no site of the inner Alpine valleys (currently) consists of over 40 graves. In addition, modern radiocarbon data indicate burial activity within sites in the Aosta or Tarentaise valleys to have been significantly shorter. For most sites, even contemporaneity of the dated burials is statistically possible, as the span of dates includes zero (Fig. 171).

This indicates that certain sites located on the shores of Lake Geneva had long-lasting significance for local prehistoric societies, while the inner Alpine communities changed the locations to bury their dead every couple of generations. The high density of grave groups around the municipality of Sion in the Upper Rhône Valley indicates this

Site	Boundary start	Boundary end	Span of dates (in years, 95.4% probability)
Aime, Le Replat	4546	4269	0-150
Bourg-Saint-Maurice, Le Châtelard	5505	3724	0-258
Thonon-les-Bains, Genevray	5030	2078	2456-2712
Pully, Chamblandes	4633	3722	0-274
Lausanne, Vidy	4624	3265	741-1039
Sion, Place et Rue de Remparts	4565	3817	449-656
Sion, Sous-le-Scex	5094	3289	459-868
Lenzburg, Goffersberg	4443	4055	115-299
Villeneuve, Champ Rotard	4781	4556	0-131
Quart, Vollein	4553	4306	18-177

Figure 171: Table indicating the boundary start and end, as well as the span of dates of sites from the model depicted in Figure 169.

location may have been of equal significance to the site of Thonon-les-Bains, Genevray, or Lausanne, Vidy.

Regarding the average size of the graves, the stone cists of the two larger necropolises of the Aosta Valley (Villeneuve, Champ Rotard, and Quart, Vollein) were rather small compared with the less regular build graves of Montjovet, Fiusey. Similarly, in the Tarentaise Valley, the graves from Aime, Le Replat, were, on average, over twice as large as the ones from Bourg-Saint-Maurice, Le Châtelard. In addition, within the assessed sites in the Upper Rhône Valley, the collective stone cist graves from the sites of Sion, Remparts, Sion, Sous-e-Scex, or Saint-Léonard, Les-Bâtiments, were well over twice as large as the single graves. This shows that, within the inner Alpine valleys, the size of the stone cists probably increased during the middle/second half of the 5th millennium BCE, but was also influenced by the intended use as single or collective graves.

On average, the sizes of the graves around Lake Geneva appear not much larger, but there is a significant size range between the sites. For example, at Thonon-les-Bains, Genevray, graves were between 0.2 and 1.3 m^2, and at Corseaux-sur-Vevey, En-Seytion, they measured between 0.1 and 1 m^2. It needs to be kept in mind that the grave sizes of single burials within the inner Alpine valleys could vary significantly (for example, within Villeneuve, Champ Rotard, they vary between 0.2 and 0.7 m^2; see Table 4). This suggests that the grave construction was influenced by its later intended use, as these size differences generally correlate with the age of the buried individual(s). For example, at the site of Corseaux-sur-Vevey, En-Seytion, it appears that smaller single burials were grouped around larger collective stone cists.

Finally, the stone cists constructed on the Swiss Plateau appear to have been generally larger than those of other sites.

Regarding the grave architecture, the ratio of stone cists within the assessed sites in the inner Alpine valleys is well over 80%. The only exceptions are a few wooden cist and/or pit graves at Aime, Le-Replat, and three sites in Sion (Remparts, Chemin-des-Collines, and Sous-le-Scex). Interestingly, at Sion, Remparts, a spatial separation based on grave architecture is evident, as wooden cists were placed some 20 m east of the contemporary single-use stone cists. Similarly, sites located on the Swiss Plateau consist exclusively of stone cists, as evidence for other grave architecture is missing so far.

In contrast, only 40–60% of the graves of Thonon-les-Bains, Genevray, and Lausanne, Vidy, were made up of stone cists, as both necropolises featured whole sectors of wooden cists and/or pit graves.

If available, the orientation of the grave structures from the assessed sites was compiled. The assessment of the direction was based on the placement of the skulls within the grave structures. The data were not only given in cardinal directions (e.g. North, East, South, and West) but also in degrees (from 1 to 360 from the centre of the grave), in order to get more precise and comparable results (Figs. 172 and 173 depict these results in graphs).

The results show that the cist graves from the sites of Villeneuve, Champ Rotard, and (presumably) Montjovet, Fiusey, were placed towards the west. In contrast, the plan of the necropolis of Quart, Vollein (Fig. 172), indicates a southwest orientation

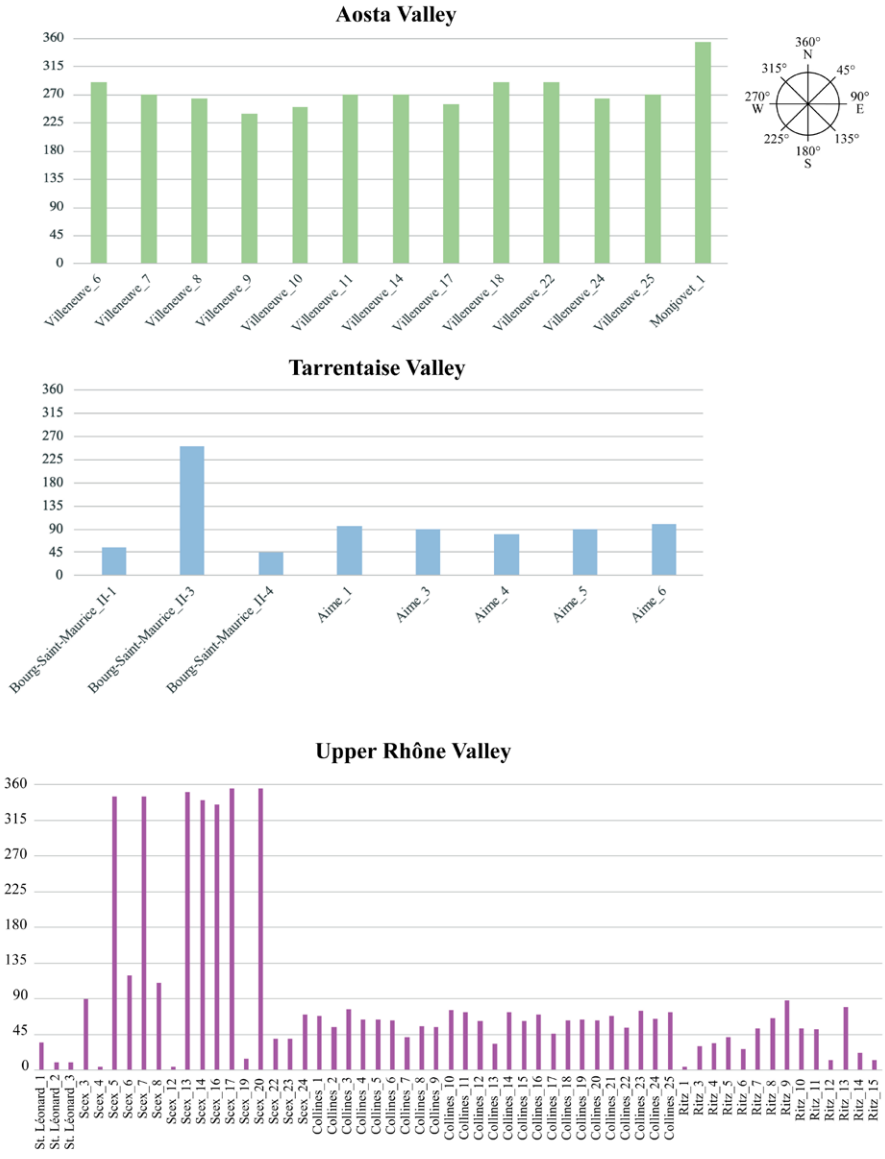


Figure 172: Orientation of grave structures of inner-Alpine sites given in degrees (y-axis).

of these graves. The few assessed burials from the Tarentaise Valley appear to have been placed with the head towards the east (with the exception of grave II-3 from Bourg-Saint-Maurice). In the Upper Rhône Valley, graves were generally oriented northeast and east. Notable exceptions are the collective stone cists from Saint-Léonard (towards the north) and the mentioned varying orientation of the graves from Sion, Sous-le-Scex (between north-south and east-west orientation, depending on the layer in which they were found).

For the sites located on the shores of Lake Geneva, a general east-west orientation was favoured. As depicted in Fig. 173 for Thonon-les-Bains, Genevray, and Corseaux-sur-Vevey, En-Seytion, there was a slight preference towards the northeast. The situation appears to have been similar on the Swiss Plateau, as the two grave groups of Däniken, Studenweid, seem to have been placed in an east-west orientation, while the stone cists of Lenzburg, Goffersberg, were placed towards the northeast (Fig. 173).

From this compilation, it appears that the graves (and the individuals buried in them) were generally oriented towards the east/northeast. The only major deviation from this norm is apparent within the two necropolises of the Aosta Valley (towards the west and southwest) and Sion, Sous-le-Scex. In addition, at Montagnieu, Grotte-du-Souhait, the

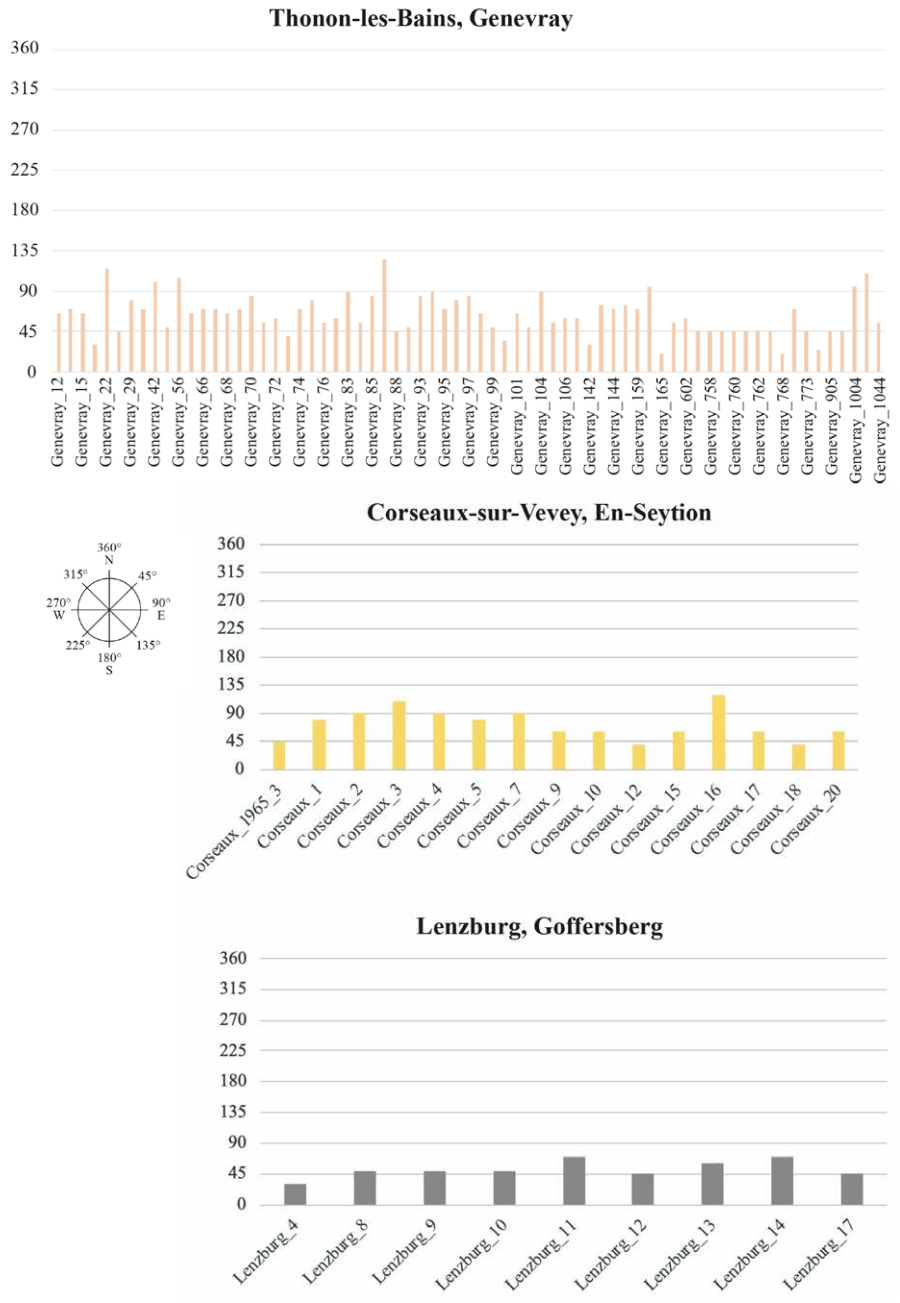


Figure 173: Orientation of grave structures from selected sites given in degrees (y-axis).

orientation of the burials varied significantly. This might have been predominantly influenced by the features of the rock face.

A further important aspect in assessing the evolution of burial practices is the evidence for the multiple use of stone cists in the form of collective graves with secondary burial practices. These conclusions are further reflected by the average minimum number of individuals (MNI) per grave for the assessed sites.

The collective use of stone cists in the Aosta Valley was suggested only for very few graves, and accordingly, the average MNI per grave was relatively low. The radiocarbon data from the isolated grave of La Salle, Derby, suggest collective burials (of three individuals) before 4500 BCE. In addition, evidence for secondary burial practices is scarce and consists of skull depositions and, potentially, the moving of bones. In the Tarentaise Valley, collective graves at Aime, Le Replat, are dated after 4500 BCE. Further to the west, at the site of Montagnieu, Grotte-de-Souhait, collective burials with the secondary ma-

nipulation of human remains occurred later (after 4450 BCE). Interestingly, both sites feature the same average MNI per grave of 2.4.

In contrast, in the Upper Rhône Valley, multiple-use graves are detectable only after 4350 BCE. This assessment is most evident within the site of Sion, Remparts (e.g. Fig. 163), but further supported by the radiocarbon data from Saint-Léonard, les-Bâtiments, or Sion, Sous-le-Scex. Secondary burial practices consist of the manipulation of human remains (extraction and/or placement of skeletal elements) and sporadic cremations. Unsurprisingly, the average MNI per grave at Sion, Remparts, or Saint-Léonard, Les-Bâtiments, is around three times higher than within sites of almost exclusively single burials (Sion, Sous-le-Scex, Chemin-des-Collines, and Avenue-Ritz).

Regarding the sites located on Lake Geneva, roughly one-quarter of the graves from the three major necropolises on both shores are collective graves (between 22 and 28%). Only at the site of Corseaux-sur-Vevey, En-Setion, is this ratio about half (47%), resulting in a minimum number of individuals per grave between 1.9 and 2.9. Regardless of the relatively high number of individuals, secondary burial practices are less frequent, as most collective graves consist of successive primary burials. Next to the manipulation of human remains, “surplus bones” and a few cremations were mentioned (the latter only for the site of Lausanne, Vidy). As featured above, the radiocarbon data of Thonon-les-Bains, Genevray, indicate the practice of collective burials, starting in the 48th/47th century BCE, while on the northern shore, they appear around 200 years later (after 4450 BCE).

At least 75% of the stone cists at the site of Lenzburg, Goffersberg, were collective burials, and unsurprisingly, the highest average MNI per grave (7.56) was determined at this site. Secondary burial elements at Lenzburg consist of the manipulation of human remains (extraction and/or placement of skeletal elements) and sporadic cremations.

The assessment of the potential influence of sex and age of the deceased individuals on the burial practice was limited due to the frequent lack of accurate anthropological data. The presented grave sites indicate an even ratio between the two sexes for the burials. The only significant exception is the site of Lenzburg, Goffersberg, and there, the sex determination is regarded as questionable, as it was made based on assumptions regarding the placement within the graves and allocation of certain types of grave goods (as expressed in Chapter 4.6.1). Regarding the age of the (assessed) individuals, around one-third were subadults. Notably, at Thonon-les-Bains, Genevray, Sion, Chemin-des-Collines, and Lenzburg, Goffersberg, this ratio could have been higher than 50%. This spread appears consistent with the expected high infant mortality rates in prehistoric times.

To sum up, based on the assessed sites, no preference for sex or age class in regard to grave architecture or the spatial placement of the deceased is evident. Once additional anthropological data become available, a more detailed examination in this regard would be possible.

In addition, the ratio of primary burials (whose remains do not appear to have been manipulated posthumously) largely relates to the number of collective graves, as necropolises with mostly single-use graves located in the inner Alpine valleys consist almost exclusively of primary burials (>85%; with the exceptions of Montjovet, Fiusey; Aime, Le Replat; and Saint-Léonard, Les-Bâtiments). In contrast, this ratio is only between 60 and 76% for the sites located around Lake Geneva and drops to 43% at Lenzburg, Goffersberg. This further signifies the different treatment of human remains between the assessed sites and zones, even if the actual grave structures appear very similar.

8.3. Regionality and chronology of grave goods

Grave goods were found within 64% (n = 32) of the total of 50 assessed multiple-use graves (containing the remains of at least three individuals). In contrast, the frequency

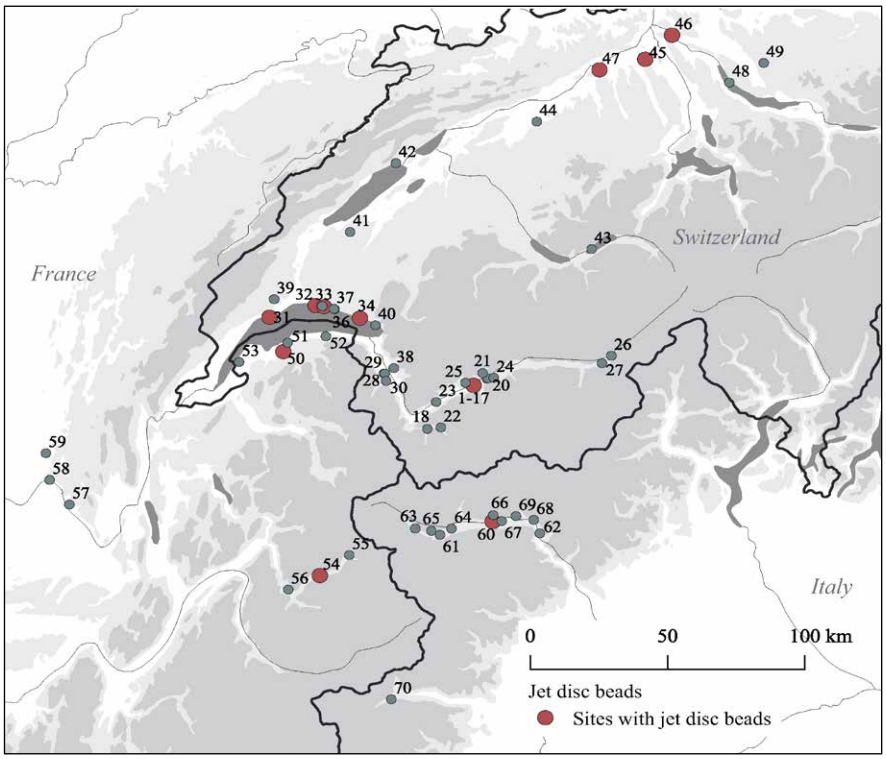


Figure 174: Map depicting Chamblandes-type sites with jet disc beads as grave goods.

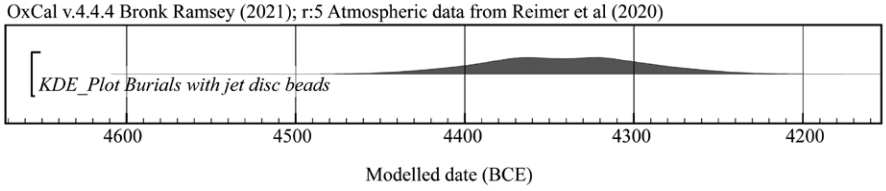


Figure 175: KDE plot of radiocarbon dates (n = 16) from burials with jet disc beads as grave goods modelled into one single phase using Oxcal 4.4.4 software.

of archaeologically recognisable grave goods appears to be significantly lower within the 167 assessed single-use graves, as only 25% (n = 42) of them contained grave goods.

The most common grave goods in the study area are jet disc beads, as these ornamental objects were found within graves across all defined zones (with probable imitations made of limestone or stone seeds, Fig. 174). As stated in Chapter 7.2.2, it remains difficult to assess the origin of the jet, however, sources located in the Swabian Alb seem most likely. This suggests some sort of contact/network between the inner Alpine valleys of Aosta and Tarentaise, for example, and today's Southern Germany. Strikingly, a KDE plot of radiocarbon dates of burials with jet disc beads (n = 16) indicates that these objects were used as grave goods for a rather short period between 4450 and 4250 BCE (Figure 175).

In contrast, seashell objects are missing within graves of the Swiss Plateau (Fig. 176), and the characteristic Glycymeris shells with a large central perforation (shell bracelets) were exclusively found within graves in the Aosta and Upper Rhône valleys. A KDE plot of the three radiocarbon dates of burials with shell bracelets implies that these objects may have been used as grave goods mainly around 4450 BCE (Fig. 177).

Similarly, other types of grave goods appear to have been more confined to specific regions/zones. For example, the boar-tusk pectorals were exclusively found within graves located on the northern shore of Lake Geneva. Similarly, Glis buttons originate exclusively from sites around Lake Geneva and the Upper Rhône Valley. A KDE plot of radiocarbon dates of the few burials with Glis buttons (n = 3) indicates that

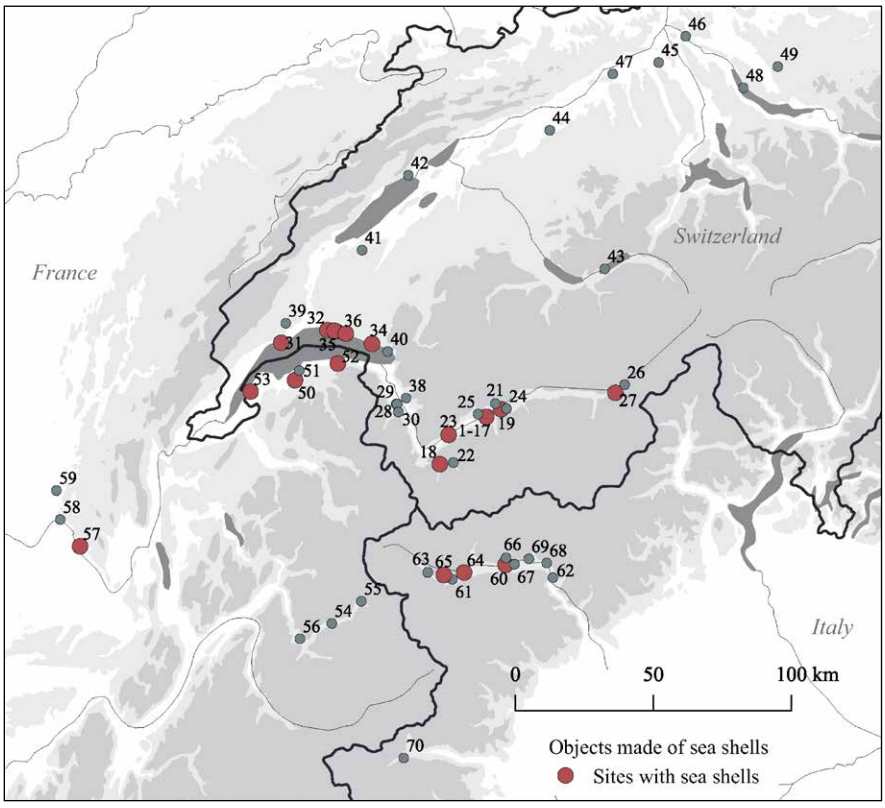


Figure 176: Map depicting Chamblandes-type sites with sea-shells as grave goods.

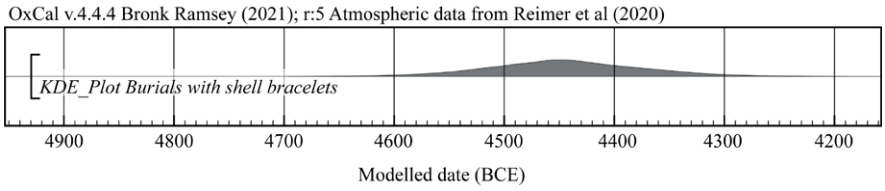


Figure 177: KDE plot of radiocarbon dates (n = 3) from burials with shell bracelets as grave goods modelled into one single phase using Oxcal 4.4.4 software.

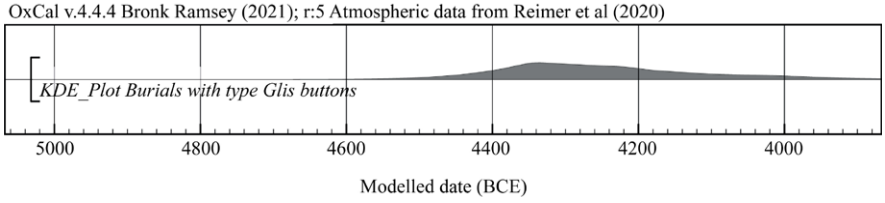


Figure 178: KDE plot of radiocarbon dates (n = 3) from burials with Glis buttons as grave goods modelled into one single phase using Oxcal 4.4.4 software.

these objects were used as grave goods mainly between 4400 and 4100 BCE (Fig. 178). Similarly, the "Doppelknopf" beads were only found within graves at Thonon-les-Bains, Genevray, and Lausanne, Vidy, on Lake Geneva. Similar to jet, they most likely originate from the northeastern Rhine area.

In this context, the flint axes (type Glis-Weissweil) were found only within graves on the northern shore of Lake Geneva and the Upper Rhône Valley, while the main area of circulation for this axe type was suggested to have been around the likely origin of the flint, in Northern Switzerland, Eastern France, and Southern Germany.

Pottery is largely missing from cist graves of the inner Alpine valleys. Additionally, while only very few vessels were found within the vast necropolises around Lake Geneva, a majority of the stone cists from the Swiss Plateau contained pottery sherds. They are mainly bag-shaped pots with two handles and "Knickwandschüsseln", typical for the

regional ceramic styles of the second half of the 5th millennium BCE. Imported ceramic vessels are only likely for the "Schulterbandbecher" from Däniken, Studenweid, and sherd(s) from a vessel with a square opening (VBQ) from Lausanne, Vidy.

Inner Alpine single graves: The scarcity of grave goods within single-use graves has already been highlighted. This is evident within the sites located in the Aosta Valley, where the ratio of grave goods per stone cist is well below 20%. The same holds true for three sites located within the municipality of Sion: Sous-le-Scex, Chemin-des-Collines, and Avenue Ritz, where under one-third of the cists contained grave goods. Apart from occasional perforated animal teeth, flint or bone tools, and rock crystal fragments, the main grave good from these sites appears to have been the shell bracelets. Further evidence for this assessment is provided by Sion, Remparts, where shell bracelets were only found within two single burials and are missing in the context of the collective graves from a younger usage phase of the necropolis.

In clear contrast, the collective graves from the Upper Rhône Valley, mainly the ones from Sion, Remparts, and the site of Saint-Léonard, Les-Bâtiments, contained a wider range of types of grave goods, especially stone and flint tools. Additionally, the two sites from the Tarentaise Valley indicate similar findings: no grave goods are reported from the single burials of Bourg-Saint-Maurice, Le Châtelard, while the two collective graves from the site of Aime, Le Repat (T5 and T6) contained different types of objects (jet disc beads, arrowheads, or animal bones).

Swiss Plateau peculiarities: In clear contrast to the sites located around Lake Geneva or the inner Alpine valleys, the stone cists from the Swiss Plateau contained larger amounts of grave goods, as a comparatively diverse range of objects was found within almost every grave of the sites of Lenzburg, Goffersberg, and Däniken, Studenweid. The ornamental objects consist of larger sets of jet disc beads or perforated animal teeth. Interestingly, seashell objects appear to be completely missing in this region. In addition, pigments (ochre) were found only in one single grave from Däniken.

The determination of the origin of flints from the stone cist graves of Lenzburg, Goffersberg, and Däniken, Studenweid, showed that mostly local raw material (originating from distances under 25 km) was used. This is not surprising, given the vicinity of these sites to the known Neolithic flint mines of Olten, Chalchofen. Nevertheless, a few distinct arrowheads were likely imported, as their raw material originates from the Jura and Alsace regions (some 100 km northwest). Another exception of the cist graves from the Swiss Plateau is the relatively high quantity of pottery sherds. With the exception of the "Schulterbandbecher", they appear to have originated predominantly from pots. Together with the large number of animal bones found within the cist graves, this could indicate food offerings as an important part of the specific burial ritual in this region.

In short, archaeologically recognisable grave goods appear to have been more frequently placed within stone cist graves located on the Swiss Plateau, specifically flint and bone tools, animal bones, and ceramic vessels. In addition, some flint objects, the jet disc beads, and certain ceramic vessels (namely the "Schulterbandbecher" from Däniken) indicate contacts between the Swiss Plateau and the Alsace/Upper Rhine region.

PART III
CONCLUSION

Interpretative approach of Chamblandes-type cist graves

9

First, this chapter proposes a model of two distinct funerary customs within the Chamblandes-type sites in the Western Alps (Chapter 9.1). Second, the broader geographical scope of the Chamblandes-type graves in northwestern Italy and south-central France is covered (Chapter 9.2). Third, various social considerations related to the results and discussions of the Chamblandes-type graves are addressed (Chapter 9.3).

9.1. Proposing distinct funerary customs

The previous discussion of the results of this work (Chapter 8) did not only identify the likely origin(s) and spread of Chamblandes-type graves, but also described the evolution of related burial practices and the regionality of grave goods in the Western Alps. The aim of this subchapter is to distinguish patterns between the different pieces of information present (e.g. grave architecture, treatment of human remains and grave goods) in order to detect specific funerary customs within the assessed sites.

The results did not indicate significant distinctions regarding the grave architecture (of the stone cists) between the sites or defined geographical zones, as they were generally constructed using four fitted, lateral slabs. The only evident architectural difference is that graves showing single use (for one individual) were slightly smaller, on average, than the ones with multiple usage phases (Chapter 8.2). Strikingly, analysing the assessed sites considering two main aspects produces an interesting pattern:

- First, the used architecture, as sites either consist almost exclusively of graves formed of stone slabs, or sites with stone cists alongside graves formed of wooden planks or pits (this is mainly represented by the ratio of stone cists per site in Table 4).
- Second, grave utilisation patterns or the treatment and final deposition of the human remains, as sites can consist of almost-exclusive single/simultaneous burials (indicating single usage of the graves), or single burials alongside graves showing collective practice (meaning multiple usage of graves) and secondary treatments of human remains (this is mainly represented by the ratios of multiple burials, primary burials, and average MNI per grave on Table 4).

These two aspects must have greatly influenced the performed burial practices within these sites, as already discussed in detail in Chapter 9.2. The maps depicting the distribution of sites exhibiting these two aspects show a general overlap and concentration of sites within certain regions of the study area (Figs. 179 and 180). As stated in Chapter 2.3.2, recurring patterns regarding the recognised rituals within a certain geographical area are regarded as a wider-spread custom of the local, prehistoric society during a certain period. Combined, this indicates at least two distinct funerary customs within the evaluated sites. They are denominated by the respective sites yielding the oldest modelled radiocarbon dates (see Chapter 8.1.3) and can be characterised as follows:

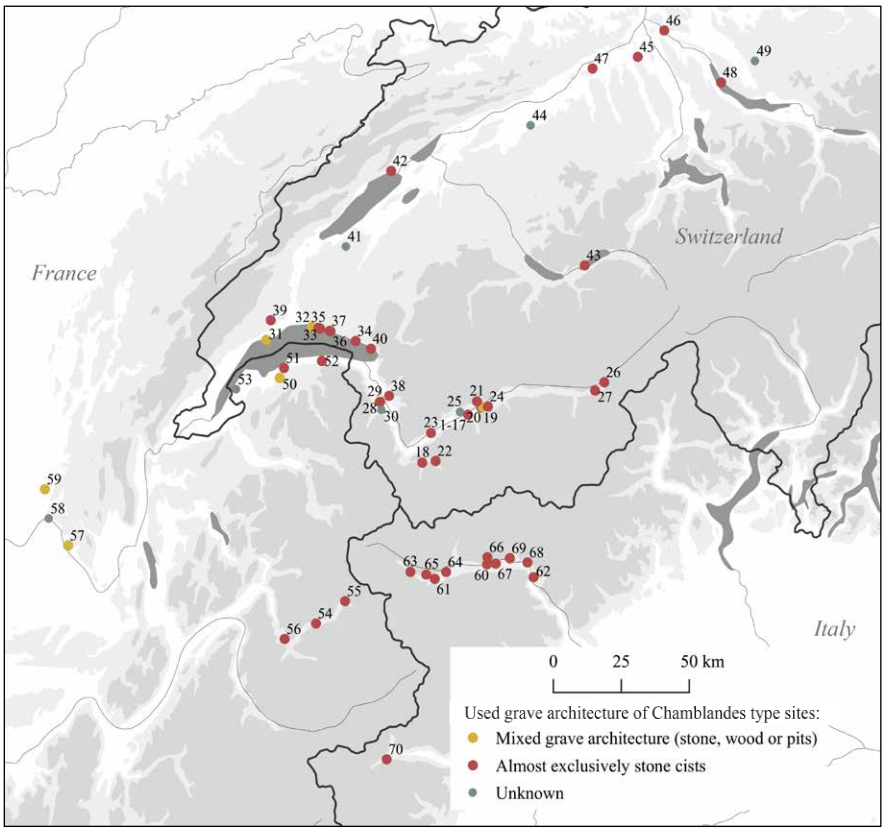


Figure 179: Map depicting the prevalent grave architecture of Chamblandes-type sites.

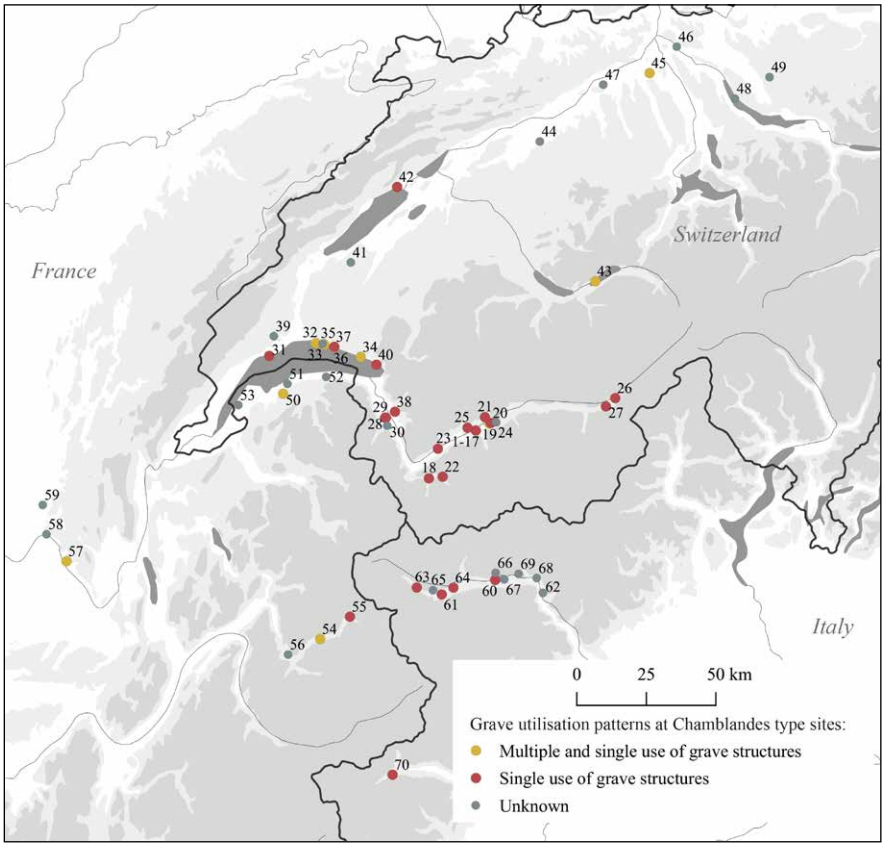


Figure 180: Grave utilisation patterns at Chamblandes-type sites regarding the deposition of human remains.

- The Villeneuve custom, consisting of sites with almost exclusively single-use graves in the form of stone cists.
- The Genevray custom, consisting of necropolises with single- and multiple-use graves (with differentiated treatment of human remains) in stone, as well as wooden graves or pits.

In addition, the available data from the objects found within the graves point to differences regarding the grave goods within these two funerary customs. Generally, grave goods appear to be more frequent within graves of the Genevray custom, especially within multiple-use/ collective graves. Next to ornamental objects, they generally consist of flint, stone, and bone tools, as well as animal bones and a few ceramic vessels. In contrast, archaeologically recognisable grave goods appear to be largely absent within burials of the Villeneuve custom, with one of the only exceptions being the Glycymeris shell bracelets. These objects were found exclusively within single-use graves in the Aosta and Upper Rhône valleys. This underlines differences in burial rituals between these two funerary customs, as well as in regard to grave goods.

Another notable difference between the two stated funerary customs is in the size and length of burial activity of the burial sites: with the exception of the necropolis of Quart, Vollein (66 reported graves), no sites of the inner Alpine valleys (currently) consist of over 40 graves. Additionally, the available radiocarbon data indicate that they had significantly shorter usage phases than the large necropolises of the Genevray custom. This implies that certain sites located on the shores of Lake Geneva had long-lasting significance for the local societies, while the inner Alpine communities changed the locations to bury their dead every couple of generations.

If one incorporates the results from the modelled series of radiocarbon data (Chapter 8.1) into the proposed approach of the subdivided aspects of grave architecture and grave utilisation patterns, the Villeneuve custom appears dominant regarding sites of the inner Alpine valleys during roughly 400 years somewhere between 4800 and 4400 BCE. This indicates lively exchange over the Alpine passes (e.g. the Great and Small Saint Bernhard).

Simultaneously, the vast necropolis of Thonon-les-Bains, Genevray, can be regarded as a centre for ancestral rituals, with intraregional significance starting simultaneously with the Villeneuve custom after 4800 BCE. The Genevray custom spread west (represented by the site of Montagnieu, Grotte-du-Souhait), north (represented by the necropolises on the northern shore of Lake Geneva), and northeast (represented by the site of Lenzburg, Goffersberg) around 300 years after its founding.

Only after 4500 BCE, elements such as multiple-use graves with collective burials or wooden cists of the Genevray custom are recognisable within the inner Alpine valleys, represented first by the site of Aime, Le Replat in the Tarentaise Valley, and, after 4350 BCE, in Saint-Léonard, Les-Bâtiments, in the Upper Rhône Valley (see Figs. 181 and 182).

This effective change in funerary custom is most evident in the necropolis of Sion, Remparts, as the graves from the first usage period between 4600 and 4300 BCE were smaller single burials within stone cists. The only grave goods were two Glycymeris shell bracelets. In contrast, the four collective stone cist graves are larger in size and exhibit secondary burial elements, as well as a wider range of grave goods. They are from a younger period of burial activity at this site (around 4200–3900 BCE) and are probably contemporary to the three additional wooden cist graves (containing the remains of single individuals) of this site.

To summarise, based on the data assessed in this study, we can distinguish two funerary customs within Western Alpine Neolithic cist graves:

The Villeneuve custom, prevalent in the inner Alpine valleys between 4800 and 4400 BCE, consisting of sites with almost exclusive single-use graves in the form of stone cists and very few grave goods, with the notable exception of Glycymeris shell bracelets.

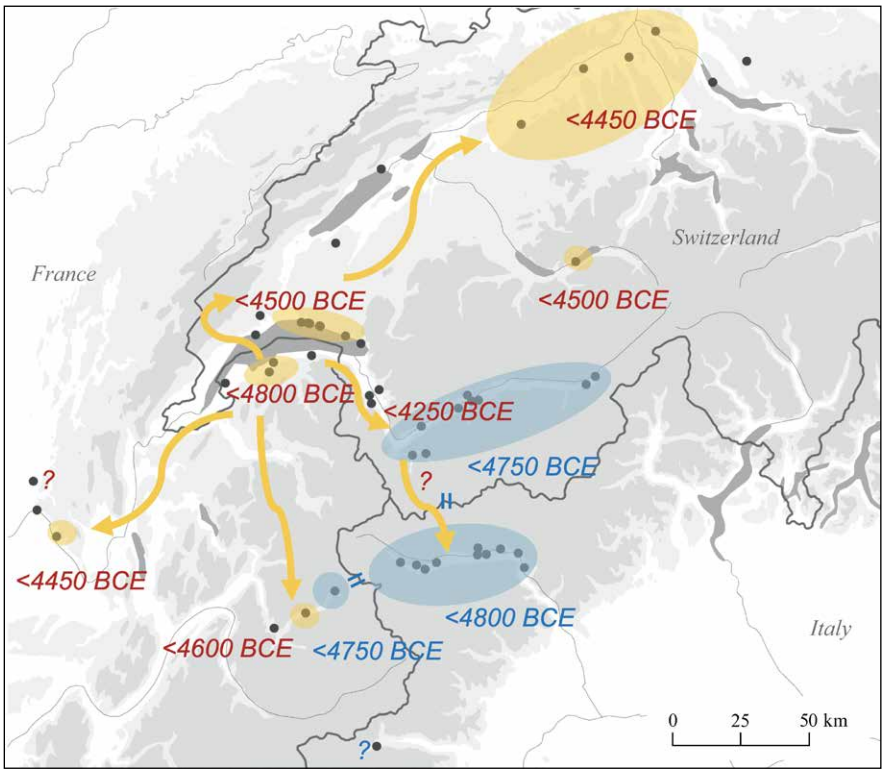


Figure 181: Map depicting the spread of the Villeneuve (in blue) and Genevray (in yellow) funerary custom within Chamblandes-type sites.

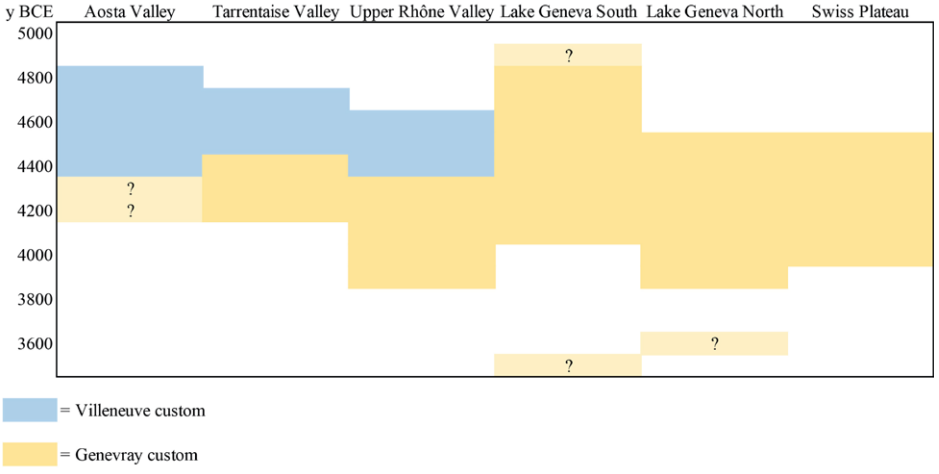


Figure 182: Chart outlining the likely chronology of the two funerary customs within Chamblandes-type sites of the defined geographical zones in the Western Alps.

The Genevray custom, starting around 4800 BCE on the southern shore of Lake Geneva, spreading to the other zones after 4500 BCE and subsequently prevalent throughout the research area until 3800 BCE, consisting of larger necropolises with single- and multiple-use graves with differentiated treatments of the human remains in stone, as well as wooden cists or pits, with a higher frequency and variety of grave goods.

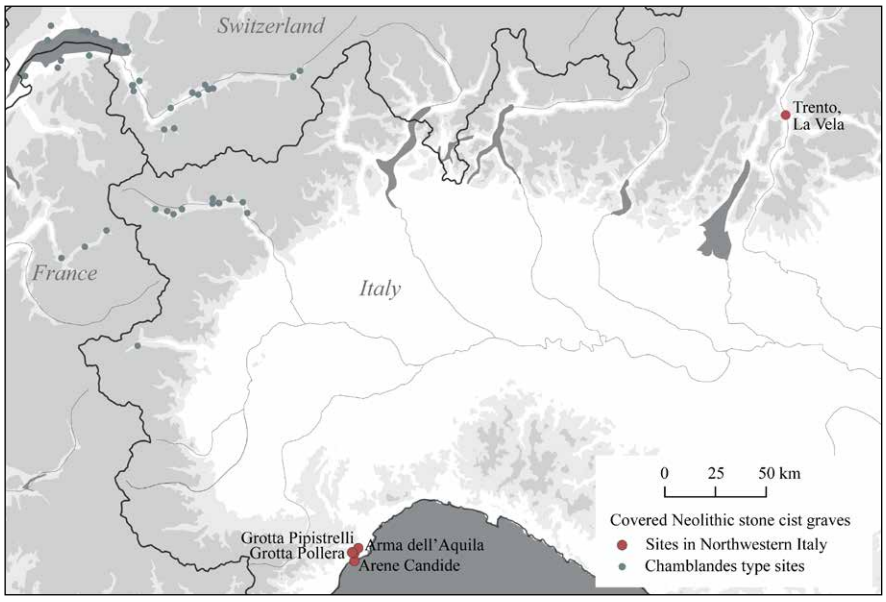


Figure 183: Map depicting the location of the covered sites located around Finale Ligure and La Vela in Trentino.

9.2. Chamblandes-type cist graves beyond the Western Alps?

This subchapter will assess the broader scope of Chamblandes-type graves. First, it will cover two groups of 5th millennium BCE grave sites displaying similarities to the Chamblandes-type, located on the Ligurian coast (Chapter 9.2.1) and the Massif Central (Chapter 9.2.2). Second, the regional Neolithic grave types of northwestern Italy and south-central France are listed (Chapter 9.2.3). Based on these data, the Chamblandes-type will be discussed in its broader geographical context and whether the featured sites from the two groups should be attributed to it (Chapter 9.2.4).

9.2.1. Group Finale Ligure

In his PhD thesis, Alain Gallay identified stone cists within prehistoric grave sites on the Ligurian coast and associated them with the Chamblandes-type (Gallay, 1977, 167). Jeunesse et al. even combined the covered Chamblandes sites in the Upper Rhône and Aosta Valley with these Ligurian sites in one block, or "zone", in their recent article on this grave type (Jeunesse et al., 2019, 65–66). This general assignment raises multiple questions regarding chronological and cultural influences between these burial sites, especially considering the ones located on the Ligurian coast (at the eastern foothills of the Ligurian Alps), which are about 250 km south of the Aosta Valley.

A good overview of the Neolithic graves on the Ligurian coast addressed as stone cists is provided by the PhD thesis of Federica Rosa (Rosa, 2015). In this work, the archaeological and anthropological aspects of graves associated with the so-called vasi a bocca quadrata (VBQ) "culture" were compiled. Out of 13 reported sites or notifications of discoveries in Liguria, five show funerary architectures that have been addressed as stone cists (in Italian "cassa litica" or "cista"). These are located in caves or rocky shelters of the karst area of the western part of the coast, called the Riviera di Ponente (Fig. 183).

At least 126 burials have been identified within these sites, of which about a quarter (n = 24) have funerary architecture made of stone (Rosa, 2015, 25). Thus, it is important to treat these stone cist burials in the context of their respective sites, as a majority of the individuals were buried in comparable mortuary positions but in simple earth pits.

Additionally, it is important to keep in mind that most of the sites covered below were investigated in the 19th century by different researchers and laypersons. Therefore, the naming of the individual graves and/or burials is problematic, and plans, drawings, or

photographs are mostly missing. This results in considerable ambiguities concerning the position of the dead, the grave architecture, and other parameters.

Arene Candide

This famous site is located in a cavern with several entrances and a system of connected rock chambers. At least 42 Neolithic burials were discovered in different excavation campaigns, but detailed information is only available for the graves investigated under Luigi Bernabò Brea and Santo Tinè between the 1940s and 1970s (Rosa, 2015, 379). From the older excavations of the 19th century, stone cists were described for the following burials:

A single burial uncovered by Giulio Barrili in 1874 was surrounded by stone slabs, while a capstone covered the lower body of the individual. In addition, burial Perrando-T.3 was reportedly surrounded by eight stone slabs (Issel, 1908, 379–380).

In 1876, Arturo Issel discovered at least seven burials, which he described as surrounded by stones; for example, in Issel-T.1, human remains were commingled and a ceramic fragment with ochre pigments was found next to them. Similarly, five to six stone slabs were placed around the upper body of the individual of grave Issel-T.3. The body was placed on the left side with flexed lower limbs, and three animal teeth and an axe blade were mentioned as grave goods (Issel, 1908, 381–385).

In the 1940s, the eastern area of the Arene Candide cave was systematically excavated under Brea. Based on the sequence of layers extending several metres, he was able to define the evolution of the VBQ ceramic style. At least ten Neolithic graves, named Brea-T.I to T.X, were discovered in these VBQ layers. They are single graves and, with the exception of the pit graves Brea-T.VIII and Brea-T.X, were all designated as stone cists (Del Lucchese, 1997, 605–609). Details about the respective grave constructions are missing, but the published photographs by Brea (Brea, 1956, Tav. 5–6, 1946, Tav. 3–5) show that in each case, an irregular number of different stone fragments was placed around the burial (Fig. 184). All individuals were placed on the left side of their body and oriented north/northeast. The few grave goods consist mainly of bone needles, which were found around the chest or shoulder area of the individuals from graves Brea-T.II, T.III, T.IV, and T.V.

Another Neolithic grave with stone architecture was discovered in 1973 under Tinè (called ACT1). Here, different lateral stone slabs and several capstones formed a stone cist containing the remains of an adult male individual in a squatting position (Tiné, 1986, 103, 111).

Arma dell'Aquila

Between 1937 and 1942, an area of about 30 m^2 was investigated under this rock shelter. Of the eight graves discovered, only a single burial, Z1, exhibited a clear grave construction: three lateral stone slabs and a boulder formed a stone cist of about 130 cm in length and 60 cm in width. According to the published data, this grave was oriented in an east-west direction and covered by two narrow capstones. Within this grave structure, the remains of an adult female individual in a left-sided squatting position were found (Richard, 1942, 73–75).

Grotta Pollera

This cave was investigated mainly during the late 19th century in the scope of different excavation campaigns. Federica Rosa lists a total of 38 burials for this site (Rosa, 2015, 85–88). Here, eight burials discovered in so-called stone cists are covered:

- A single burial, Morelli-T.1, was uncovered in 1885 with lateral stone slabs forming a cist. The skeleton of an adult individual in a left-sided squatting position and traces of ochre were found within. A ceramic vessel with ochre traces, a triangular stone axe blade, the skull of a goat, and deer bones were placed next to the human remains.

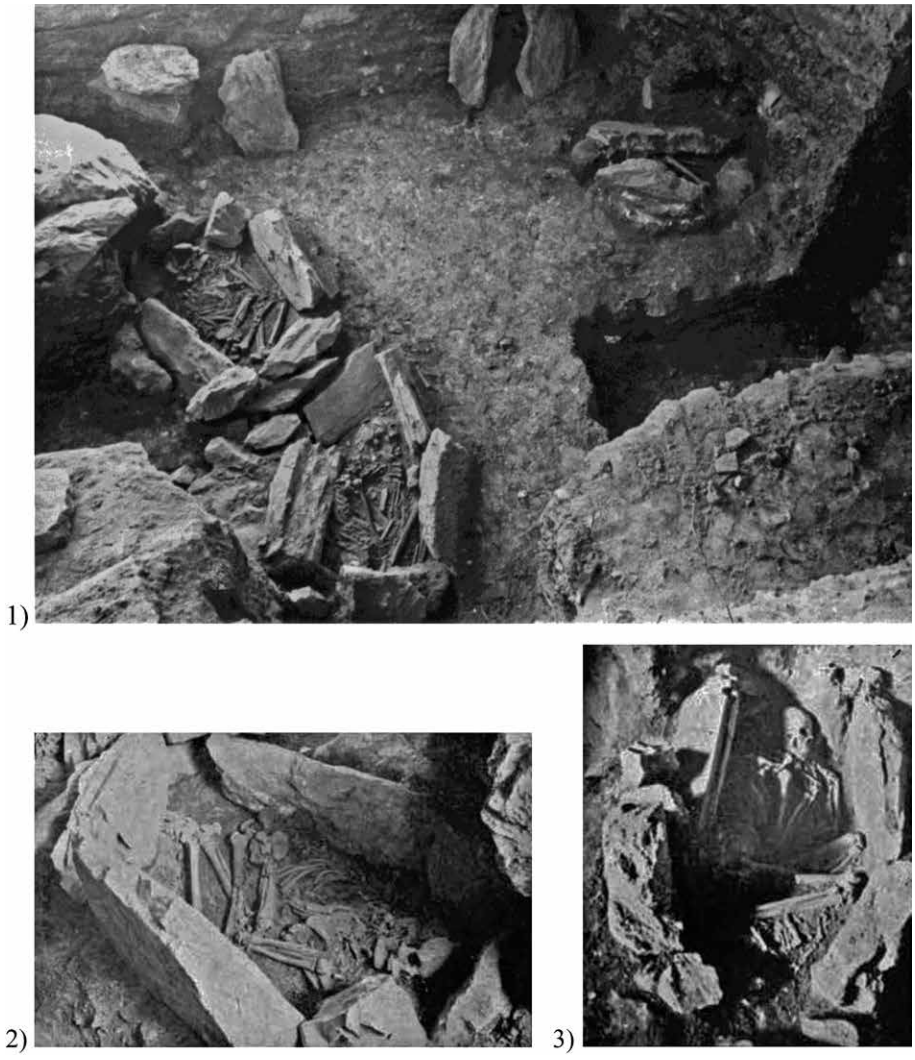


Figure 184: Arene Candide. Selected pictures: 1) top view of graves Brea-T.I to III, 2) top view of graves Brea-T.I, 3) top view of grave Brea-T. IV (source: © Brea 1946).

Not far from this grave, another burial of an adult male (Morelli-T.2) was found in a similar placement. Reportedly, this individual was also surrounded by irregular vertical stone slabs (Issel, 1908, 308).

- Excavations between 1886 and 1888 uncovered at least three adult single burials in tombs with stone architecture (called Rossi T.5, T.6, and T.13). Red ochre and different shell fragments were noted as grave goods (Rosa, 2015, 68–69).
- In 1892, two burials, Issel-Morelli-Rovereto T.1 and T.6, were reportedly found within stone cists. The first grave contained the remains of a subadult female individual in a left-sided squatting position, with four shells and a bone awl as grave goods (Rosa, 2015, 69–71).
- In 1972, Tinè discovered a pit grave lined with limestone slabs (called Tinè T.1). The remains of a 20- to 25-year-old female individual and a newborn child were found within it. The adult female was in a left-sided squatting position, and the remains of the child were placed by her torso (Messeri et al., 1977; Tiné, 1973).

Grotta Pipistrelli

During an excavation campaign between 1954 and 1957, seven single burials were discovered in this cave. The human remains were placed in a left-sided squatting position, and stone cists were reported for two graves. Only very limited information is available;

in the cloudy photograph of Tomb 1 (Almagro-T.1), some set stone slabs are probably visible (Almagro, 1955, 19) and, around the burial pit of Burial 3 (Almagoro-T.3), the same can be suspected (Almagro, 1955, 21).

Radiocarbon data

Recently, a large set of radiocarbon dates of the covered sites from Liguria was published (Sparacello et al., 2020, 2019). A total of 23 samples originate from burials in so-called stone cists and meet the quality control criteria stated in Chapter 5.1 and 5.3 (table 6). They date to the period between 4800 and 4500/4450 BCE (Fig. 185), almost simultaneous to the covered graves in the Alpine valleys (e.g. the Aosta Valley). On the Ligurian coast, these burials were used only over a shorter period of some 300 years (Fig. 186).

Site	Grave	Individual (bone number)	Bone sampeled	Lab Code
Group Finale Ligure (Italy)				
Arene Candide	Perrando-T.3	Arene Candide 6 PE	Bone (?)	GX16931 A
	Issel-T.1	AC8PE	Rib	GrM-14488
	Issel-T.2	AC7PE	Cortical	GrM-14487
	Brea-T.I	AC_6731.1 (AC I BB)	Cortical	GrM-16990
	Brea-T.III	AC III BB	Cortical	GrM-15875
	Brea-T.IV	AC6726.4(Prob. ACEIVBB)	Rib	GrM-13673
	Brea-T.V	ACVBB	Rib	GrM-14528
	Brea-T.VI	ACEVI	Scapula	GrM-14499
	Brea-T.VI	Arene Candide VI BB	Tooth	GX16962-G
	Brea-T.VII	ACVIIBB	Rib	GrM-14530
	Brea-T.VII	Arene Candide VII BB	Bone (?)	GX16963-G
	Brea-T.IX	ACIXBB	Rib	GrM-14526
	Tinè-ACT1	Arene Candide T1 Tinè	Bone (?)	Beta 109802
Arma dell'Aquila	Zambelli T1 (Z1)	Arma dell'Aquila Z1	Bone (?)	OxA-V-2365
	Zambelli T1 (Z1)	Arma dell'Aquila Z1	Bone (?)	GrN-17730
Grotta Pollera	Morelli T.1	PO13	Rib	GrM-14497
	Morelli T.2	PO10	Rib	GrM-14509
	Rossi T.5	PO12PE	Rib	GrM-14492
	Rossi T.6	PO14PE	Bone (?)	GrM-14490
	Rossi T.13	PO31	Rib	GrM-15943
	Issel-Morelli-RovaretoT.1	PO1 Issel- Morelli	Tooth	GrM-13669
	Tinè T.1	PO1 Tinè	Rib	Lyon-14603
Grotta Pipistrelli	Almagro-T.1	PIPI 1_dep23.I.2_JUV	Cranium	GrM-15884
	Almagro-T.3	PIPI3_ElMuerto N3DEP 23(III 55)	Cortical	GrM-13618
	Almagro-T.3	PIPI3_ElMuerto N3DEP 23(III 56.1)	Cortical	GrM-13620
	Almagro-T.3	PIPI3_ElMuerto N3DEP23 (III.56.2)	Cortical	GrM-18891
	Almagro-T.3	PIPI3_ElMuerto N3DEP23 (I.1.1)	Cortical	GrM-13621
	Almagro-T.3	PIPI3_ElMuerto N3DEP23 (I.1.2)	Cortical	GrM-18940
Group Massif Central (France)				
Ludesse, Banleu	Ludesse 1	?	Femur	BE-14308.1.1
Clermont-Ferrand, Pontcharraud	Sep. 12	?	Bone (?)	Ly 7918

Table 6: Radiocarbon dates (n = 30) of covered sites from Finale Ligure and the Massif Central.

If one includes the set of 46 considered valid radiocarbon data of burials in earth pits of the covered Ligurian sites (Sparacello et al., 2020, 38–42, 2019, 70–72), it becomes apparent that these necropolises had longer, or rather multiple, periods of burial activity. While pit graves were already in use during the first half of the 6th millennium BCE, the graves with the surrounding stone placement appear to have been a more recent evolution of this burial practice (Fig. 187). A differentiated analysis of the grave architecture shows that burials within pit graves mostly date before 4800 BCE at the sites of Arma dell'Aquila and Pipistrelli, while both grave types were in use simultaneously at the sites of Arene Candide and Grotta di Pollera.

Radiocarbon age (BP±1σ)	Calibrated age (BCE, 2σ range)	Atomic C/N ratio	C content (%w/w) in gelatin	Collagen yield (%w/w)	Reference
Group Finale Ligure (Italy)					
6255±240*	5656-4616	?	?	?	Rosa 2015
5786±25	4710-4550	3.13	43.84	?	Sparacello et al. 2020
5815±25	4778-4553	3.15	41.71	?	Sparacello et al. 2020
5765±25	4699-4542	3.15	36.92	?	Sparacello et al. 2020
5860±30	4828-4616	3.13	42.61	?	Sparacello et al. 2020
5813±25	4776-4551	3.20	45.69	?	Sparacello et al. 2020
5800±25	4720-4551	3.26	44.49	?	Sparacello et al. 2020
5685±25	4601-4451	3.24	46.35	?	Sparacello et al. 2020
5260±135*	4358-3771	?	?	?	Rosa 2015
5825±25	4786-4603	3.43	34.40	?	Sparacello et al. 2020
6255±255*	5667-4608	?	?	?	Rosa 2015
5830±25	4786-4608	3.22	41.10	?	Sparacello et al. 2020
5700±60*	4701-4370	?	?	?	Rosa 2015
5804±33	4775-4546	?	?	?	Sparacello et al. 2019
5800±90*	4886-4449	?	?	?	Rosa 2015
5745±25	4685-4502	3.10	43.60	?	Sparacello et al. 2020
5777±25	4705-4547	3.20	40.90	?	Sparacello et al. 2020
5860±25	4789-4619	3.24	47.50	?	Sparacello et al. 2020
5840±25	4789-4613	3.24	46.10	?	Sparacello et al. 2020
5775±25	4703-4547	3.28	39.40	?	Sparacello et al. 2020
5839±25	4790-4612	3.26	41.30	?	Sparacello et al. 2020
5790±30	4715-4548	3.13	40.24	?	Sparacello et al. 2020
5770±30	4715-4548	3.23	41.60	?	Sparacello et al. 2020
5772±25	4699-4546	3.20	39.00	?	Sparacello et al. 2020
5799±25	4719-4551	3.20	37.80	?	Sparacello et al. 2020
5799±28	4704-4545	3.20	34.68	?	Sparacello et al. 2020
5882±25	4832-4699	3.22	39.70	?	Sparacello et al. 2020
5860±28	4826-4617	3.38	38.86	?	Sparacello et al. 2020
Group Massif Central (France)					
5293±28	4239-3997	3.26	50.8	0.5	This work
5330±55	4328-3996	?	?	?	Loison 1998

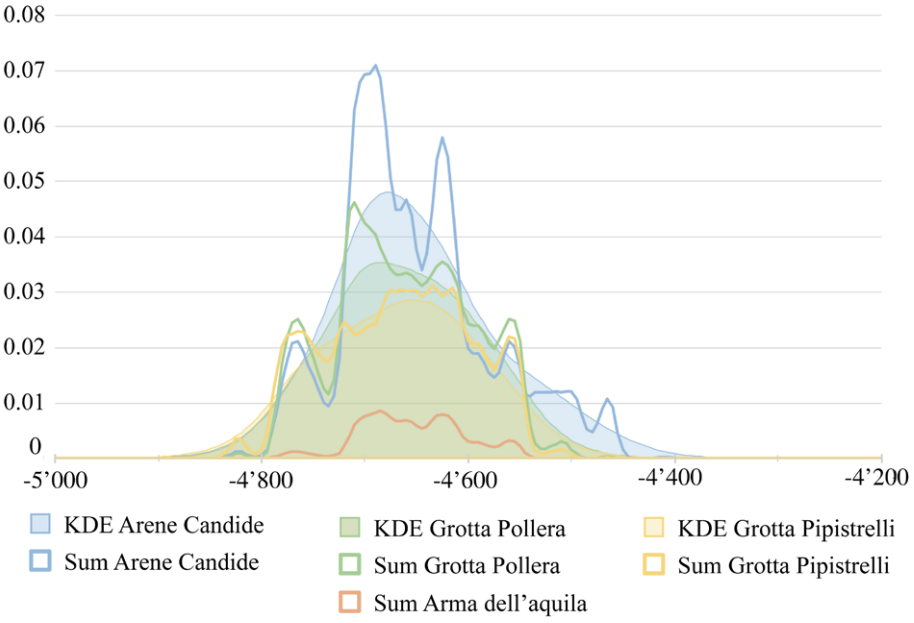


Figure 185: Considered valid radiocarbon dates from burials within Ligurian "stone cists" of Arene Candide (n = 9), Grotta Pollera (n = 7), Grotta Pipistrelli (n = 6), and Arma dell'Aquila (n = 1) displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software.

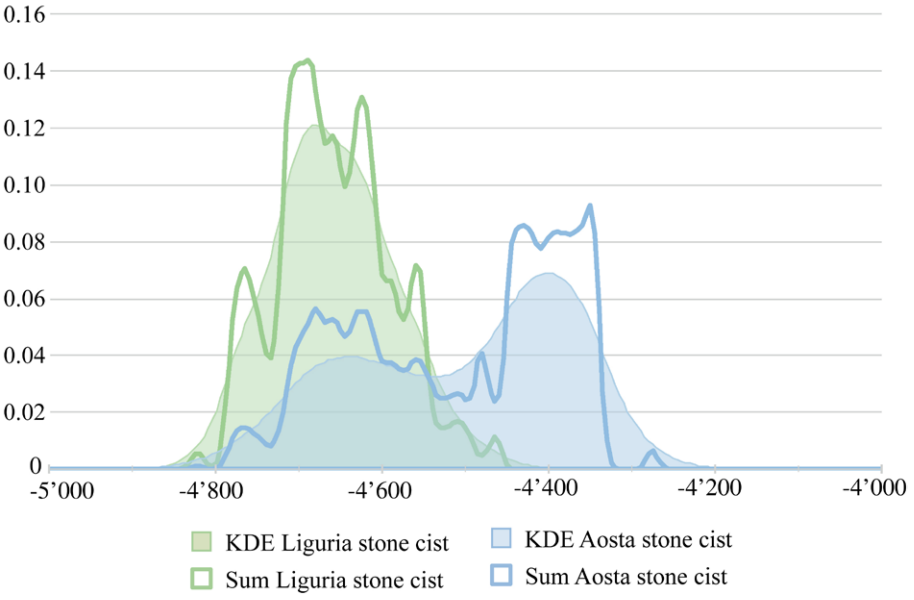


Figure 186: Considered valid radiocarbon dates from burials within stone cists from Liguria (n = 23) and Aosta (n = 21), displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software.

9.2.2. Group Massif Central

The Massif Central is a mountainous region in southern-central France, reaching heights of up to 1885 m above sea level (the Puy de Sancy). It is located around 300 to 400 km west of the classical Chamblandes-type necropolises of the western Alpine region. In this subchapter, two sites with Neolithic stone cist graves located on the northern Massif Central will be covered more extensively: Ludesse, Banleau, and Clermont-Ferrand, Pontcharaud 2 (both Puy-de-Dôme, France), including a subsequent listing of the available radiocarbon dates. A map of the geographical position of sites mentioned in this subchapter is depicted in Fig. 188.

In his PhD thesis, Alain Gallay listed the stone cist of Ludesse, Banleau, as a Chamblandes-type grave (Gallay, 1977, 186). Since this grave is largely unknown, the scarce information will be covered here in detail. In addition, one bone sample was extracted and radiocarbon dated in the context of this work. Similarly, few pieces of information

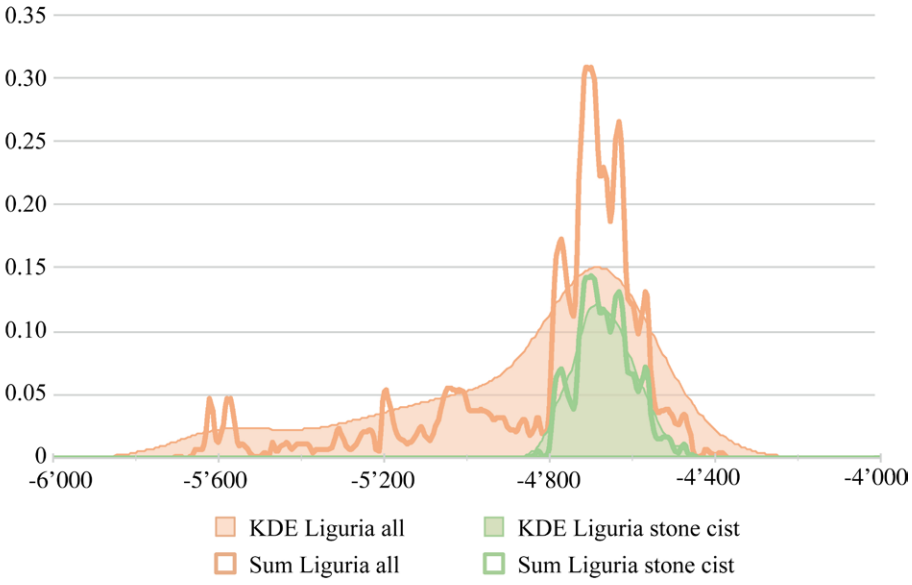


Figure 187: Considered valid radiocarbon dates from the covered sites in Liguria, displayed as overlapping sum and KDE plots using Oxcal 4.4.4 software. Red: all dates (n = 69), green burials within "stone cists" in Liguria (n = 23).

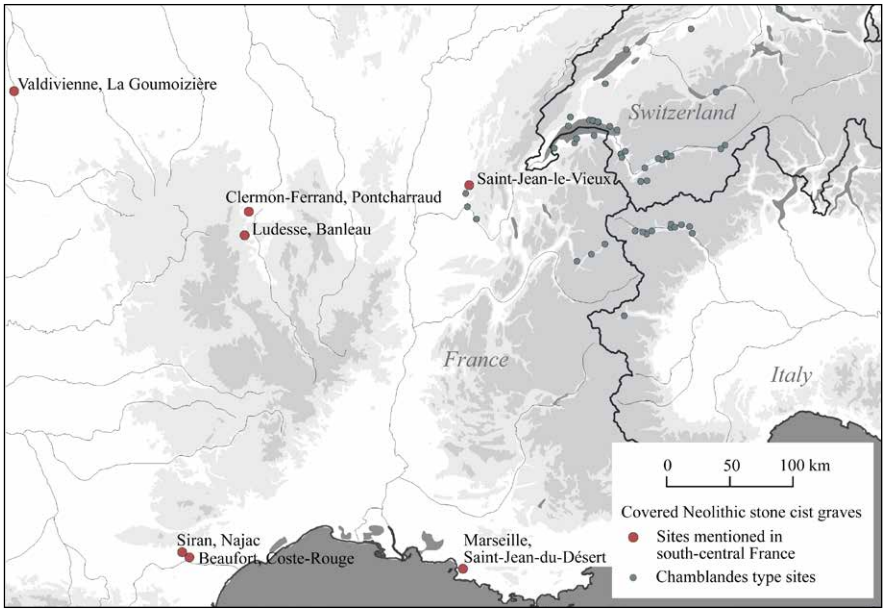


Figure 188: Map depicting the location of the covered sites of Neolithic stone cist graves in south-central France.

are available for the necropolis of Clermont-Ferrand, Pontcharaud 2. The lack of plans or pictures of the excavated stone cist grave is especially unfortunate. A recent excavation campaign in 2019 revealed very interesting discoveries, which will be highlighted here for the first time.

Ludesse, Banleau

The municipality of Ludesse is located about 20 km southeast of the city of Clermont-Ferrand. The grave was discovered in 1966 at Banleau meadow, near the old road leading from Ludesse to the village of Saint-Sandoux. During clearing work, a tractor unearthed a large limestone slab about 60 cm below ground level. Beneath, further limestone slabs forming a cist filled with earth, small charcoal fragments, and human remains were found. The landowners informed the museum in Clermont-Ferrand, and soon after, an excavation took place under the lead of the "Antiquités Préhistoriques" in the spring

of 1967. The soil from within the stone cist was sieved and the bones were collected for an anthropological examination. The following description of this grave is mainly based on the publication by Jean-Pierre Daugas (Daugas, 1968, 181–185).

- Grave architecture: Rectangular stone cist formed by six lateral stone slabs (with the long sides consisting of two stones each). The massive capstone (155 cm long, 120 cm wide, and 17 cm thick) was still in situ. The grave floor was paved with irregular flat stones. The used stones were made up of limestone from Montpeyroux, about 2.5 km to the east. The grave had a length of 135 cm and a width of 73 to 83 cm and was oriented in a north-south direction (Fig. 189). Due to the previous clearance work, the stratigraphy of the site could not be documented or examined, thus it remained unclear whether the tomb was originally covered by a grave mound or constructed in a pit (below the prehistoric surface).
- Human remains: The bones were evaluated by Ginette Billy and the following information is based on her findings (Billy, 1968). The skeleton has been preserved to a large extent (with a total of 115 bones). The sex and age determination of the individual was based on the skull, pelvic bones, and teeth. The remains belong to an adult male between 20 and 25 years of age with a body height of approximately 165 cm (based on the long bones). Regarding burial placement, the deceased individual was lying on the right side of the body, facing east. The legs were flexed, with the knees at the level of the pelvis (and the feet under the pelvis) and the arms were folded across the chest or stomach. The head appeared to have been slightly elevated on a mound of earth (Fig. 189).
- Grave goods: Fragments of eight perforated, thin, boar-tusk lamellae were found near the knees of the buried individual. In the area between the lower limbs and the southern lateral slabs, four ceramic sherds (fragments of at least two vessels), two limestone fragments, and one flint object were documented. The latter had a triangular form with two worked sides. It was interpreted as an arrowhead, but could probably also be addressed as a scraper (Fig. 190).

Clermont-Ferrand, Pontcharaud 2

The site is located east of the city of Clermont-Ferrand, on the western bank of the Artière, a tributary of the Allier River. This necropolis was discovered during the construction of a highway and excavated between January and May 1986. Only the area directly affected by the construction work could be investigated, covering about 3000 m^2. There, the graves of at least 94 individuals were excavated and documented, and including some scattered bones, the minimum number of individuals found in the investigated area reached 113 (Loison, 1998, 189). The graves were not distributed in a regular pattern over the investigated area but concentrated in some places. Gilles Loison distinguished six groups, with graves oriented around a so-called founder burial (French "sépulture fondatrice") (Loison, 1998, 193). The majority are primary single burials in earth pits. Graves containing the remains of two individuals or secondary burial elements were found only sporadically. Most individuals were placed on their left side with their legs contracted and facing east (in an east-west orientation). An exception is the multiple burial of seven individuals (called Sep. 31–37); five of them were placed lying on their stomachs (in a prone position) in a shallow pit (Loison, 1998, 193).

The anthropological investigation of the excavated human remains revealed 67 adults and 43 minors. The determination of sex was possible in 56 cases, resulting in 26 males and 30 females. No differentiation regarding age at death or sex within the burial practices could be determined. The absence of neonates, low number of infants (n = 3), and underrepresentation of 5- to 14-year-olds was highlighted (Loison, 1998, 199).

Grave goods were found within 23 graves and consisted mainly of ceramic vessels, flint objects, and animal bone tools. A total of 14 burials were accompanied by pottery fragments, indicating influences of various 5th millennium BCE ceramic styles. Most

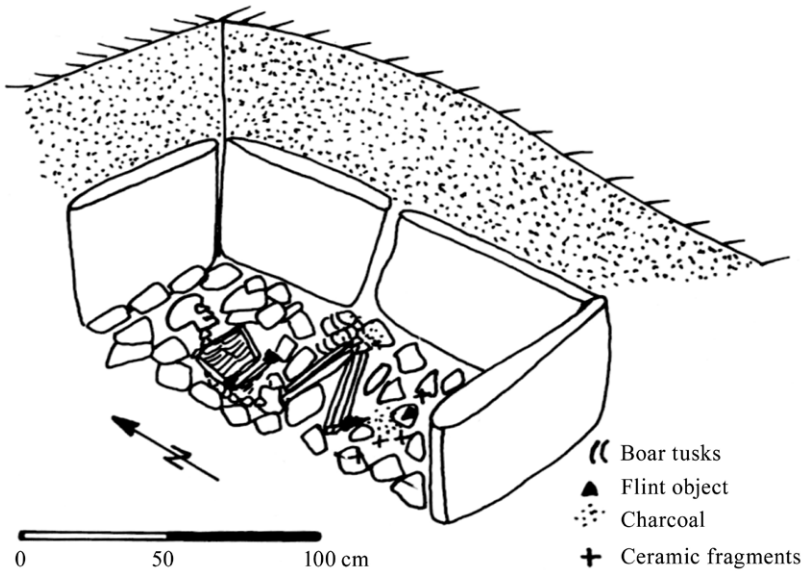


Figure 189: Drawing of the grave of Ludesse, Banleau (source: Modified by N. Steuri after Daugas 1968).

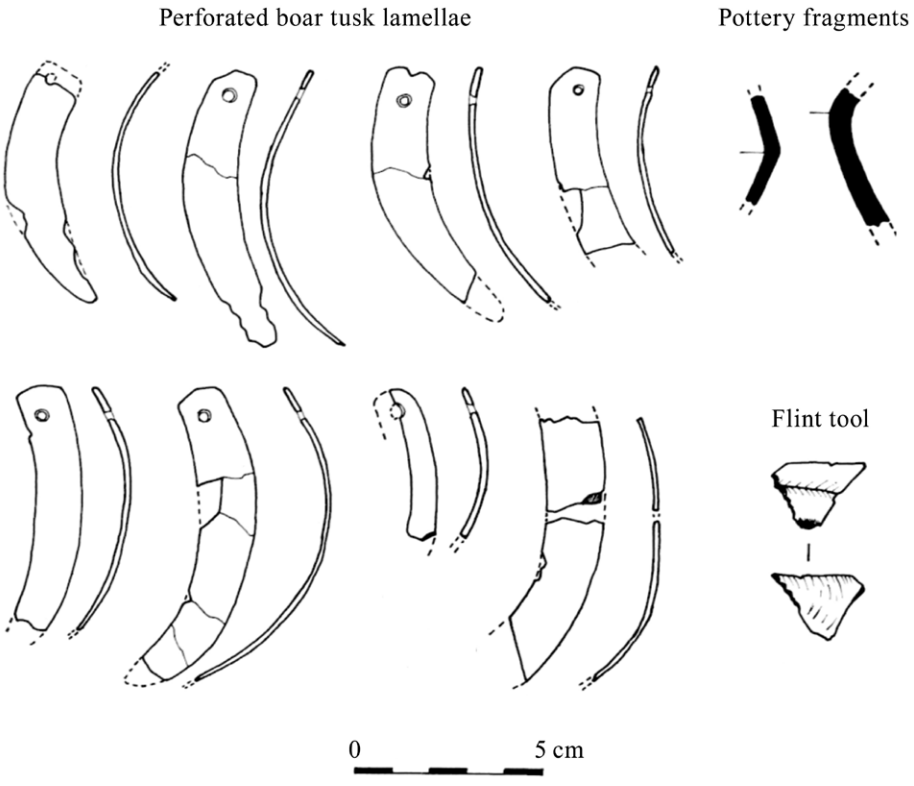


Figure 190: Objects from the grave of Ludesse, Banleau (source: © Daugas 1968).

notable is a vessel with a square opening from Sep. 55, showing typological links to the younger phase of the northern Italian VBQ (Loison and Gisclon, 1991, 406).

Regarding the discussion of the Western Alpine Chamblandes-type, grave Sep. 12 is of particular interest, since lateral stone slabs formed a cist around the burial. Unfortunately, no further details, plans, or pictures of this grave are available. In addition, as no particularities regarding the placement of the buried individual were noted, the skeleton was probably found lying on the left side of the body with contracted legs. The stone cist grave Sep. 12 was interpreted by Loison as the "founder burial" of group 2, since four

Figure 191: Clermont-Ferrand, Pontcharaud 2. Top view of the grave Sep. 5130 during the excavation in 2019 (source: © F. Prodeo).

burials/graves were placed around it (Loison, 1998, 195). Of further interest are burials Sep. 39 and Sep. 65, as they were placed in the same burial pit. Stacked stone slabs lined the pit and a vertical stone slab separated the two individuals. Local stone was used for the construction of both of these graves, and it was suggested that they originate from the nearby hills of the Puy de Crouël or the Puy de la Poix (Loison, 1998, 189–193).

In the winter of 2019, the eastern area of the necropolis of Pontcharaud 2, which had previously not been investigated, was excavated. According to communication with excavation leader Frédéric Prodeo, at least four additional stone cist graves were discovered in this section (Fig. 191), including one containing the cremated bones of at least two individuals (communication with Frédéric Prodeo, 2021).

Radiocarbon data

Until now, there was some ambiguity regarding the age of the grave of Ludesse, Banleau. Its initial investigator, Jean-Pierre Daugas, dated it to 2200–2100 BCE (Daugas, 1968, 185), while Alain Beyneix attributed it to the Chasséen "culture" (Beyneix, 1997, 164). In order to assess the age of the buried individual in this grave, it was decided to conduct radiocarbon dating in the context of this study. Almost the entire skeleton of Ludesse, Banleau, is preserved in Musée Bargoin in Clermont-Ferrand (Puy-de-Dôme, France). A bone sample from the right femur was extracted in July 2020 and was subsequently treated according to the procedure covered in Chapter 5.3. This analysed sample meets quality criteria and dates to the period between 4239 and 3997 cal. BCE (Table 6).

Regarding radiocarbon data from the site of Clermont-Ferrand, Pontcharaud 2, two bones from the area disturbed by construction work were dated during the excavation in 1986. Accordingly, they have very high uncertainty ranges of ± 130 years and date in the period of 4550–3650 BCE (Loison and Gisclon, 1991, 406). After the anthropological evaluation was completed, three additional bone samples were radiocarbon dated (Loison, 1998, 203). Among them was one sample from the individual buried in stone cist grave Sep. 12 and, with an acceptable uncertainty range of ± 55 years, it dates to 4328–3996 cal. BCE (Table 6). In the context of the recent investigation of the eastern area of the necropolis of Pontcharaud 2, a series of new radiocarbon dating tests have been carried out. Among them, at least one individual buried in a stone cist was dated to approximately 4350–4050 BCE (communication with Frédéric Prodeo, 2021).

9.2.3. Neolithic burial types of northwestern Italy and south-central France

Without any claim to completeness, this section will highlight some 5th millennium BCE burial types in today's south-central France and northwestern Italy, with a special focus on graves with stone slab architecture.

The areas north and east of the study region of the Western Alps will not be covered in detail here, as few 5th millennium BCE grave sites are known (and none of which contained stone cists). These sites mainly consist of the so-called Schaffhausen Group in northeastern Switzerland. The main necropolis of Schaffhausen, Schweizersbild (Schaffhausen, Switzerland), consists of 22 pit graves with burials placed in a supine position (Moinat and Stöckli, 1995, 240–242). Although Werner Stöckli dates them around 4000 BCE, a few older radiocarbon dates fall within the first half of the 4th millennium BCE (Stöckli, 2016, 98–99). The Schaffhausen Group graves are probably related to the 5th millennium BCE burial traditions of Southwestern Germany and Alsace (France). The burials of the so-called Hinkelstein and Grossgartach Neolithic "cultures" dating to the first half of the 5th millennium BCE were generally inhumations in flat graves (often rather shallow pits), while individuals of the subsequent Rössen were mostly in crouched positions on the right side of the body (Dammers, 2003). The following Michelsberger "culture" (between 4400 and 3500 BCE) lacks evidence for necropolises and shows a greater diversity regarding the treatment of human remains (Jeunesse, 2010).

Northwestern Italy: The covered sites on the Ligurian coast showed that individuals were buried in simple pits, as well as pits with surrounding stone placement. North of Liguria, in the regions of today's Piedmont and Aosta, so far only the burial practice of stone cist graves is represented (Chapter 4.1 and 4.7.2), as no burials corresponding to the typical VBQ pit graves could be detected (Rosa, 2015, 22–23).

In the regions east of Liguria, in today's Lombardy and Emilia Romagna, necropolises with exclusively single burials in oval pits are known in this period. The individuals were generally placed in a left-sided squatting position, with the head in the east and facing south. The few grave goods consist of typical VBQ ceramic vessels. Available radiocarbon dates from these burials (with uncertainty ranges below ± 60 years) date between 4800 and 4100 BCE (Rosa, 2015, 91. 108–116, 185–204).

A notable exception in this context is the Neolithic necropolis of La Vela near Trento. This site is located around 400 km to the east of the Ligurian coast and consists of around 266 graves (Fig. 183). At least three types of graves can be distinguished: simple pits, pits surrounded by stone blocks, and cists formed of stone slabs. Little information is available, but at least two stone cist graves (T3 and T4, Fig. 192) are single burials with individuals in a left-sided squatting position (Pedrotti, 2000, 145-150). Their grave goods consist of ceramic vessels with incised decorations and square mouths. In addition, a radiocarbon date of the individual from T4 is available, dating to 4495–4331 cal. BCE (Pedrotti, 2000, 178). On the basis of the few available data, the stone cist graves of La Vela show remarkable parallels to the Chamblandes-type, both in terms of placement of the individuals, grave construction, and chronological position.

South-central France: The coexistence of diverse burial types was apparent for the broader Chasséen period (between 4500 and 3500 BCE) in Southern France (Gernigon, 2014; van Willigen et al., 2014; Vaquer, 1998, 183). Individual sites with stone cist graves are known throughout the area; for example, two larger cists below a mound in Marseille, Saint-Jean-du-Désert (Beyneix, 1997, 51). A cluster of sites of stone cist graves is known from the area north of the Pyrenees, near the Mediterranean coast (Languedoc-Roussillon, France). Jean Vaquer names around 15 sites of Neolithic graves with stone architecture. Most of them are old discoveries that have not been sufficiently documented or evaluated. They are not homogeneous and, apart from small stone cists (with vertical access), they consist of stone coffins (with horizontal access) that were partly surrounded by burial

Figure 192: Trento, La Vela. Top view of the stone cist graves T3 and T4 (source: © Pedrotti 2000).

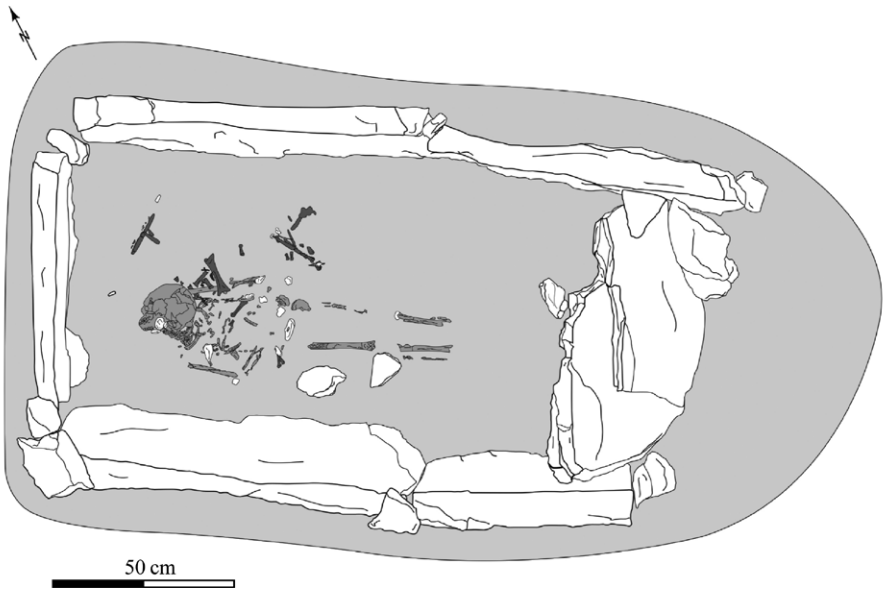


Figure 193: Beaufort, Coste Rouge. Drawing of the grave (source: Vaquer et al. 2007).

mounds. Also, with regard to the orientation of the graves, no pattern could be recognised. Information about human remains is mostly not available and bones are generally not preserved (Vaquer, 2007, 13–23). More information is available for only two sites:

- Beaufort, Coste Rouge (Hérault, France), consisting of one vertically accessible coffin, originally formed by seven lateral slabs and three capstones (measuring 170 by 80 cm, Fig. 193). Inside were the remains of one subadult individual and a relatively large number of grave goods (e.g. shell beads, bone tools and flint arrowheads). One radiocarbon date (3636–3376 cal. BCE) represents the only one available for all of these burials from Languedoc-Roussillon (Vaquer et al., 2007).
- Siran, Najac (Hérault, France), consisting of four larger stone coffins and inhumations of up to three individuals in squatting positions. Based on the grave goods, they probably date to the 5th millennium BCE (Mahieu, 1992).

To the north, at the Paris Basin and in Normandy, dozens of massive so-called Passy-type monuments were documented. Most of these monuments have an elongated, keyhole

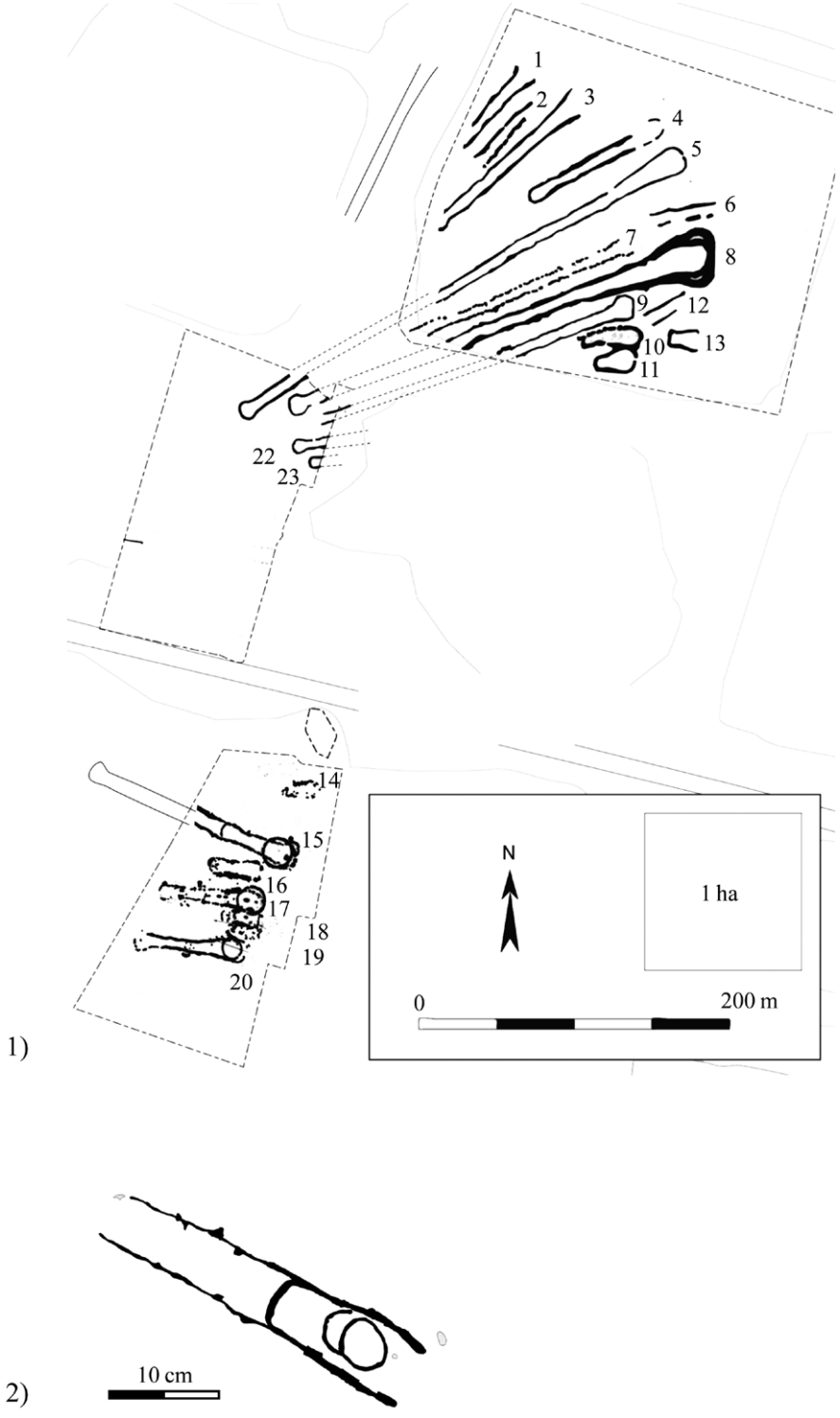


Figure 194: Maps of selected Passy-type funerary monuments: 1) Passy (source: © Pillot/ Lemercier 2014), 2) Saint-Jean-le-Vieux (source: Website INRAP).

shape of surrounding ditches from 20 to over 300 m in length and a uniform width of 8 m (Fig. 194.1). In the enclosed area, artificial earth mounds (of up to 6 m in height) and postholes of palisades could be detected. Often only one main burial was found per monument. This large number of work for single individuals led to an interpretation of an increasing social differentiation with emerging elites. The few grave goods, such as flint arrowheads or objects made of game bone, suggest the ideological importance of

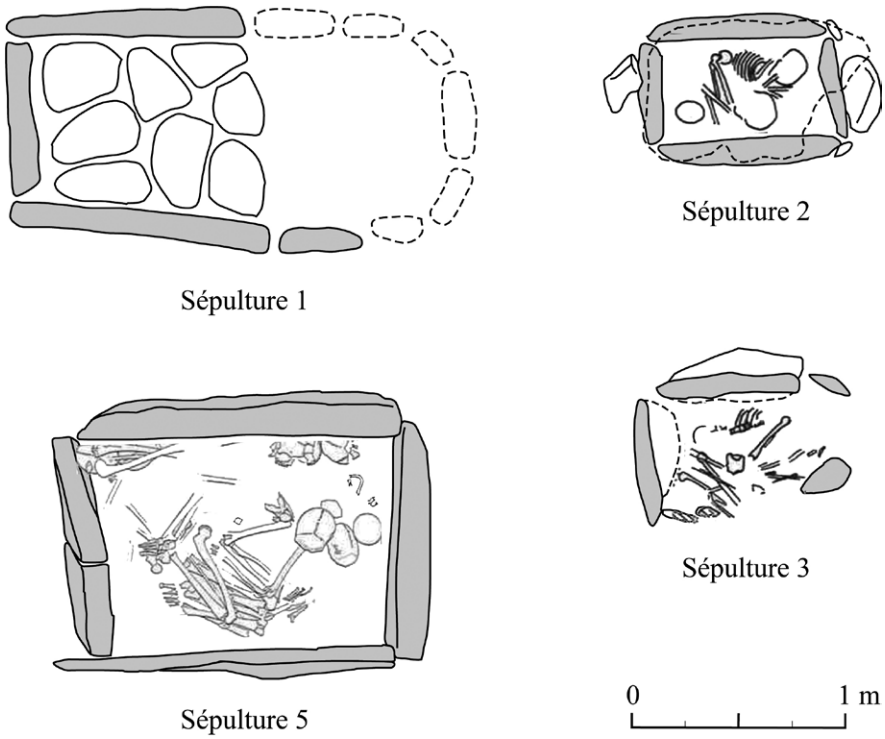


Figure 195: Valdivienne, La Goumoizière. Drawings of selected graves (source: N. Steuri after Soler 2007).

hunting within the burial practice (Chambon and Thomas, 2010). Radiocarbon dating places the majority of these graves in the period between 4800 and 4400 BCE (Pillot and Lemercier, 2014, 222).

Between 2009 and 2017, at least four Passy-type graves (up to 56 m in length) were discovered and excavated near Saint-Jean-le-Vieux (Fig. 194.2) and Saint-Vulbas (both Ain, France) (INRAP website). These probably date to the middle of the 5th millennium BCE and are very interesting due to their vicinity to likely contemporaneous Chamblandes-type sites such as Montagnieu, Grotte-du-Souhait (around 30 km to the south).

In addition, so-called type Malesherbes graves were exclusively documented at two sites in the Paris Basin. These are burials in a squatting position in pits that were covered by an oversized stone slab weighing up to 18 tonnes. These graves are related to the emergence of megalithic elements in this region. The available radiocarbon dates suggest a dating to the second half of the 5th millennium BCE (Simonin et al., 1997).

Another special site needs to be pointed out here. Near Valdivienne (Vienne, France), on the western flank of the Paris Basin (about 150 km east of the Atlantic coast of La Rochelle), stone cist graves were discovered next to the farm “La Goumoizière”. At least five rectangular stone cists were excavated between 1960 and 1962 and in 1996. Two of these were collective burials with the remains of eight individuals each, and the primary burials were mostly placed in a squatting position (Fig. 195). The few grave goods consist mostly of single ceramic vessels of the so-called Cerny style of the second half of the 5th millennium BCE. The series of 21 radiocarbon dates of bone samples from these graves is noteworthy (Soler, 2007, 117–123). These indicate that the smaller graves with single and simultaneous multiple burials date to around 4500 BCE, while larger collective burials and multiple phases of use date to 4250/4050 BCE.

In the context of this subchapter, one should also mention Neolithic stone cists from the Jura (Franche-Comté, France). Very little information is available on the seven sites listed by Alain Gallay. These are multiple, larger stone cists (of near megalithic character) below mounds, and the buried individuals were mostly in a squatting position (Gallay,

2008, 180). Based on the typology of the grave goods, they most likely date to the late 5th to early 4th millennium BCE.

9.2.4. Scope of the Chamblandes-type cist graves

The information from the previous subchapters enables assessing whether the covered stone cist graves from Finale Ligure or the Massif Central should be attributed to the Chamblandes-type (using the criteria stated in Chapter 2.1.1).

Focusing on the graves from Finale Ligure, the question arises whether they correspond to a similar "zone" or funerary tradition as the Chamblandes-type graves from the Aosta or Upper Rhône valleys (as suggested by Jeunesse et al., 2019, 65–66): The radiocarbon dates suggest a contemporaneity between burials within graves with stone architecture from Finale Ligure and the ones from the Aosta Valley (Fig. 186). In addition, the placement of the primary burials appears to have been relatively uniform, in a left-sided squatting position. So-called stone cist graves in Liguria were found exclusively in the context of caves, or rock shelters, while sites located in the Swiss and Italian Alpine valleys are located on plateaus or (river) terraces. A detailed comparison regarding the specific grave architecture is only possible to a limited extent due to the little information available. At the site of Arene Candide, however, the photographic documentation of the individual graves shows that no actual "cist" was formed. Rather, irregular stones in combination with rock niches and boulders surrounded the deceased individuals and thus rather represent an enclosure. This is in contrast to the more carefully constructed graves of the necropolises of the Aosta or the Upper Rhône valleys, which usually consisted of four fitted slate slabs. This difference most likely had an influence on the performed burial practices; while the tombs in Liguria were designed as single graves for a single use, multiple burials (of ≤ 3 individuals) and secondary burial elements (e.g. the deposition of skulls, moving/removal of bones, cremations) can be detected at the covered Chamblandes-type necropolises. This important differentiation (and the geographical distance) thus allows conclusions to be drawn on different funerary customs between these regions.

Regarding the two sites from the Massif Central, the grave of Ludesse, Banleau, can be addressed as a cist, since the stretched placement of an adult individual was not possible. With a length of 135 cm and a width of 75 cm, the grave of Ludesse appears to have been larger than most stone cists of the Western Alpine region. Some of the covered Chamblandes-type graves exhibit similar dimensions, such as stone cist graves T1 (130 by 74 cm) and T3 (140 by 80 cm) from Saint-Léonard, Les-Bâtiments (Corboud et al., 1988, 4–7) or grave 1/1946 (130 by 100 cm) and grave 2/1946 (130 by 90 cm) of Däniken, Studenweid (Steuri and Hafner, 2022, 13–16). In addition, there are numerous examples of the use of several stone slabs to create the long sides of Chamblandes-type stone cists (for example, within the necropolises of Sion, Avenue Ritz, or Sion, Chemin-des-Collines; Moinat et al., 2007a, 281, 288). Based on the available data, it was not possible to assess whether the stone cist of Ludesse was constructed in a pit. Regarding the burial position, the individual was placed on the right side of the body. This is atypical for Chamblandes burials, but not without comparison in the western Alpine region; such a placement is, for example, evident within grave T143 at Thonon-les-Bains, Genevray (Baudais et al., 2017, 108), pit grave T8 at Sion, Sous-le-Scex (Honegger, 2011, 122), or the single individual from Niederried, Ursisbalm (Steuri et al., 2023).

Regarding the grave goods of the stone cist from Ludesse, Banleau, five to seven of the eight boar-tusk lamellae exhibit a single cylindrical perforation at the proximal end. Sets of perforated boar-tusk lamellae were occasionally found within Chamblandes-type graves on the northern shore of Lake Geneva. They usually consisted of 25 to 35 lamellae, where the distal area (tip) was removed and the tusk perforated on both sides. They were arranged in two to three stacked rows and are addressed as pectorals (see Chapter 7.3.5). Therefore, the boar-tusk lamellae from Ludesse were likely used as

pendants, rather than part of a pectoral. The two depicted pottery fragments (Fig. 190) do not allow for any conclusions to be drawn on the former vessel shape. Only recognisable was a bend and/or segmented wall ("Knickwand"), which is a relatively common element of bowls of the Chasséen ceramic style (e.g. they represent between 18 and 26% of the vessels of the Classical Chasséen layers 7–9 at the eponymous site of Camp de Chassey; Stöckli, 2009, 186).

On the basis of this assessment, there are no evident distinctions between the stated characteristics of the Chamblandes-type and the grave from Ludesse, Banleau. Additionally, the extracted bone sample of this grave dates to the last quarter of the 5th millennium BCE. Therefore, the individual from Ludesse was contemporaneous to the larger Chamblandes necropolises of the Western Alps (see Chapter 8.1.1). Similarly, based on the little available information on stone cists from Clermont-Ferrand, Pontcharaud 2, they appear to be similar in terms of grave construction, mortuary position, and chronological age to the Chamblandes-type. Additionally, at least one ceramic vessel from this site has a square opening and therefore implies cultural contact with (and beyond) the Alps.

To sum up, the stone cist grave from Ludesse, Banleau, complies with the stated characteristics of this Western Alpine grave type (Chapter 2.1.1), although it is located 200 km west of the Chamblandes graves of the Alpine region. The same can be suspected for some grave structures from the necropolis of Clermont-Ferrand, Pontcharaud. In addition, the radiocarbon data indicate that the stone cists of these two regions were largely contemporaneous. Overall, the stone cist graves from the Massif Central should be considered in the context of the Chamblandes-type, an interesting case leading to further social considerations (see Chapter 9.3.3). In contrast, the covered graves from the sites located on the Ligurian coast appear fairly distinct from the characteristics of the Chamblandes-type, especially considering assumed funerary practices. Therefore, this work suggests that they should not be considered in the same "zone" or funerary tradition. Whether this applies also for the isolated, few stone cist graves from Trento, La Vela (Chapter 9.2.3), appears likely, but their assessment would require further information.

9.3. Social considerations

This subchapter first discusses some ramifications that the proposed funerary customs likely had on aspects such as performed rituals or the social life of a grave (Chapter 9.2.1), followed by some related general thoughts on the corresponding emergence of necropolises and megalithic elements in the Western Alps (Chapter 9.2.2). It will close with some thoughts on what the geographic scope, burial practices, and funerary customs related to Chamblandes-type graves might indicate about the local prehistoric societies (Chapter 9.3.3).

9.3.1. Ramifications of funerary customs

The proposed funerary customs likely have implications for the performed rituals of the first farming societies in the Western Alps. For example, stone cists indicating only single use were most probably not opened after a primary burial was placed inside the grave (due to the lack of evidence of later manipulations of these human remains), in contrast to the multiple usages of cist graves. In addition, this reopening of graves and the collecting, moving, or removal of human remains was probably accompanied by ritualised actions or, in itself, was a ritualised act. Overall, this would indicate that performed rituals could vary significantly, even within largely identical grave architecture.

The "social life" of the grave is related to these aspects of the grave structures within the actions of the local prehistoric community. This is especially relevant to collective

graves because, at some point, their period of use terminated and the stone cist was probably sealed off only at that moment by placing (a) massive capstone(s) (which sometimes weighed over a tonne) on top of it.

In that sense, a multitude of decisions regarding specific burial practices were made by the community. Most of the covered necropolises of the Genevray custom, for example, featured the simultaneous use of single burials and collective graves (e.g. at the sites of Thonon-les-Bains, Genevray, or Lenzburg, Goffersberg). This fact raises the question of the basis upon which individuals were buried: either alone or in a collective grave. Was the decision based on status, other social roles, or kinship ties? The latter appears likely for individuals buried together within one grave structure, but genetic data are required to properly evaluate this hypothesis. Similarly, sites of this funerary custom often featured graves with different funerary architecture. This leads to the additional question of the basis of the decision to use stone or wood to construct the graves for specific individuals (or place them in a simple pit without any grave architecture).

These issues remain difficult to address, especially since no clear differentiations of funerary treatment based on sex or the age at death of the individuals were evident within the assessed sites (with the exception of smaller graves reserved for single, primary non-adult individuals). This result indicates that the aspects of gender and age classes were not reproduced in the mortuary sphere of the Chamblandes-type graves. This conclusion is not too surprising, as Robb and Harris (2018, 2–4, 13) noted that Neolithic burials usually were not gendered, with little to no difference in positioning or grave goods between males and females.

In addition, no explicit gender expressions through grave goods are evident. The only probable exception would be arrowheads being mostly linked to adult males; however, this is questionable and would require new anthropological evaluation of the human remains from specific sites (e.g. Lenzburg, Goffersberg).

Whether status and other social roles were expressed by grave goods remains difficult to assess. For example, among the main types of grave goods of the Villeneuve custom are shell bracelets, which were found only in a few graves. This raises the question of whether these objects signified a special social role for these individuals within the community. The same applies to the Genevray custom with the few boar-tusk pectorals or perforated axes. The possible function and social meaning attributed to the grave goods found within Chamblandes-type graves remain difficult to verify. In addition, their contextualisation, according to the aspects stated by Fredrik Ekengren (2013), is only possible to a limited extent; regarding the intentionality of grave goods, it is likely that all covered objects denominated as grave goods of the assessed sites were deposited intentionally in the grave. Recurring patterns of grave goods within the two funerary customs have already been highlighted. They, however, could also indicate differences in performed burial rituals. Most notable is the frequent occurrence of animal bones within graves of the Genevray custom, which could indicate food offerings and/or a symbolic or spiritual role of animals in the burial ritual. Similarly, ceramic vessels appear only among the graves of this funerary custom. This further indicates food offerings and feasting as a more frequent part of the burial rituals of the Genevray custom. The spatial arrangement of these objects within the grave is rather difficult to assess, especially considering the frequent reopening of graves and the related manipulations of their content, as well as natural disturbances (e.g. taphonomic processes or groundwater).

In addition, it remains difficult to evaluate whether some objects were 1) part of the everyday life of the deceased; 2) newly made for the burial; and/or 3) used in the performance of rituals. It appears likely that tools made of bone, stone, and flint were part of everyday life, while animal bones and ceramic vessels were used in the performance of rituals. Finally, there is greater uncertainty in assessing the different kinds of ornamental objects, which could have been part of all three aspects stated above.

9.3.2. Emergence of necropolises and megalithic elements

The emergence of necropolises indicates that these Alpine Neolithic societies decided to bury dead members in distinct areas, removed from settlements and daily activities, in contrast to the few Mesolithic tombs that were sometimes in close proximity to fireplaces (see Chapter 2.2.1). This hints at the public character of funerary rituals and the central social relevance of necropolises. Necropolises can be addressed as a place of memory of a community that used the necropolis often over many centuries (based on the radiocarbon data, Chapter 8.1). In that sense, necropolises can be seen as reverence points in the Alpine landscape for one or multiple prehistoric communities, because a) they were generally placed next to general movement networks of people, and b) they often had prominent and extensive character. It can be assumed that they had an identity-forming function for the community through diverse and complex ceremonies. Specific evidence for these performed rituals remains hard to detect archaeologically and is scarce, but, for example, burned animal bones or deliberately destroyed pottery vessels could be remains from a funerary feast (e.g. at the site of Lenzburg, Goffersberg). In short, the necropolises were a "lieu de mémoire", a reverence point, with "historical significance in the popular collective memory" (Nora, 1989) for Neolithic communities.

In that sense, the emergence of the first, few megalithic stone stelae in the study area is also associated with Chamblandes-type necropolises:

- For example, at the site of Thonon-les-Bains, Genevray, an oblong stone was found in the eastern area of the necropolis between the stone cist graves. It is assumed that this was originally placed horizontally in the adjacent pit and probably had an erected height of 2.6–2.9 m from the ground (Fig. 50).
- An actual megalithic complex consisting of nine standing stelae was also discovered about 60 m southeast of the necropolis of Sion, Chemin-des-Collines (Moinat, 2007, 285).

In regards to the meaning and function of these stelae, they can first and foremost be understood as markers of special areas, like the necropolises must have been. In the same sense, smaller "stelae" (cylindrical stones) were found as surface markers for stone cist graves (for example, at the sites of Thonon-les-Bains, Genevray [Baudais et al., 2017, 77, 81] and Corseaux-sur-Vevey, En-Seytion [Baudais and Kramar, 1990, 71]). The emergence of megalithic elements may also be related to societal changes, with megaliths interpreted as markers of more hierarchical social structures (Müller, 2001, 424–426). Thus, stelae were erected to be widely seen as a manifestation of power, whether of an individual or a collective (Testart, 2012, 436–444). Moreover, megalithic monuments can contribute to the formation and retention of the social community as a kind of cultural memory (Furholt and Müller, 2011, 15–32), linking back to the "lieu de mémoire" aspect.

Taken together, Chamblandes-type graves are connected to the emergence of necropolises, as well as a few megalithic elements within the Western Alpine region. This implies a social and symbolic construction or marking of the landscape (Laporte and Ramírez, 2022; Renfrew, 1976) in the 5th millennium BCE. This adaptation with a lasting, visible imprint can be referred to as the creation of certain "ritual landscapes" (Robb, 1998), especially when thinking of the vast necropolis of Thonon-les-Bains, Genevray, or the cluster of sites around the municipality of Sion. The visual influence of necropolises (and standing stones) extended into the surrounding Alpine landscape, controlling perception and impacting the viewer (McCormack and Bergh, 2019), particularly since they were often placed close to the prehistoric communication axes of valleys or waterways.

9.3.3. Who built Chamblandes-type cist graves?

Based on the information covered in this work (Chapter 9.2.4), the scope of the Chamblandes-type graves can be clearly delimited to the North, East and South of the defined geographical zones. To the west, however, the boundary appears less clear,

mainly due to the two covered sites from the northern Massif Central. As these stone cist graves in central France fit the stated characteristics of the Chamblandes-type, this raises several questions discussed below. In addition, the recently excavated site of Ambérieu-en-Bugey (Ain, France) adds to the complexity of the scope of the Chamblandes-type. No stone cists were discovered, but it was suggested that the graves of this necropolis largely consisted of wooden cists. It is likely that traces of these constructions of organic material were often missed during previous late 19th or early 20th-century excavations at other sites. This could not only influence the ratios of stone- to wooden cist graves of some necropolises, but even extend the frequency/reach of Chamblandes-type graves to some extent, as Ambérieu-en-Bugey is located around 30 km Northwest of the site of Montagnieu.

Then again, the availability of the raw material of stone slabs must have played a major factor in the emergence of stone cists as the preferred funerary architecture for a community. But as the covered graves from Finale Ligure demonstrate, there is a significant difference between the construction of a rectangular cist with fitted slabs and the delimitation of pits or burials with stone blocks. This distinction additionally supports the differentiation of the Chamblandes-type graves from other Neolithic funerary structures. Therefore, this work argues that the construction of stone cists was not the automatic outcome, but rather a conscious decision which was made by the local community.

Taken together, the rather clear geographical scope of the Chamblandes-type graves indicates that the local prehistoric societies in the Western Alpine region reacted similarly to the death of an individual within the community, as expressed by grave architecture and the treatment of human remains. In addition, the radiocarbon data indicate a sharp decline in Chamblandes-type graves after 4000 BCE throughout the assessed regions. This indicates a relatively rapid change in burial customs at the beginning of the 4th millennium BCE.

Furthermore, the available data on the age and sex distributions of the individuals buried within the assessed sites largely follow demographic expectations. In addition, the radiocarbon data were not only able to indicate the likely origins and spread of this grave type, but also that burial activity often lasted over generations. Together, this could indicate a rather stable local community, where most to all individuals of the community were buried in the same delimitated area.

Whether this is an indicator of an egalitarian society is difficult to answer. The treatment of individuals after their death does not need to represent the society of the living. In addition, differences in regards to used grave architecture and single or multiple usage of graves could well have been intended for individuals with special and/or different social roles. In this context, specific grave goods such as shell bracelets or boar-tusk pectorals could have been used to signify selected individuals of the community.

The few grave goods do not indicate strong contacts or influences of the local communities to larger, neighbouring “cultures” or pottery styles of the second half of the 5th millennium BCE. Rather, the people who build the Chamblandes-type graves appear to have been on the peripheries of such (e.g. the Chasséen and Saint-Uze in the West, the vasi a bocca quadrata in the south and the Rössen in the north). In general, the attribution of the Chamblandes-type graves, as expressions of burial practices, to specific archaeological cultures defined mainly by similarities in material culture (e.g. pottery or ornamental objects), appears unsuitable for this context and rather antiquated.

Taken together, these pieces of information allow some conclusions on the central question of this subchapter which is what Chamblandes-type graves actually represent or indicate about the societies that build them. This work suggests that Chamblandes-type graves should be regarded as specific grave architecture(s) with corresponding sets of burial practices, as at least two funerary customs are distinguishable, indicating differences, or evolutions in performed rituals (or specifically the treatment of the

human remains). The funerary custom favoured or required rectangular boxes formed by stone slabs or wooden planks. These were of small sizes, as primary burials were exclusively placed in a crouched position. Sometimes, these rather standardised graves were organised in vast necropolises, used over generations. All of this could indicate continuity and stable communities. It appears that the people who constructed and used Chamblandes-type graves shared common funerary practices. Considering the specific geographic features of the region, separated by high mountain ranges or large lakes and rivers, this appears rather striking. Whether these prehistoric societies shared other common traits (e.g. the organisation of settlements, shapes of ceramic vessels, dietary preferences, etc.), has to be further examined.

10 Synthesis

The overarching aim of this study was to assess the evolution of burial practices of the first farming societies in the Western Alpine region during the 5th millennium BCE. The common grave structure used by these communities on both sides of the Alpine ridge are known as the Chamblandes-type. These box-shaped graves formed by stone slabs or wooden planks have a research history reaching back to the 19th century, which almost entirely focused on the area around Lake Geneva and the Upper Rhône Valley. The stated objective of this work was to be achieved by three major approaches: 1) Tracking the origin and spread of Chamblandes-type graves, 2) evaluating the characteristics or recognisable burial practices within sites and 3) assessing the identified grave goods.

A significant contribution of this work is the expansion of the knowledge regarding the scope of the Chamblandes-type graves. For the first time, the intraregional significance of this grave type in today's Switzerland, France, and Italy was comprehensively assessed by plugging existing research gaps. Specifically, almost no information was previously available for sites of the Aosta Valley, and the importance of this inner Alpine valley was only highlighted in the context of this research and all available data for these sites were compiled (Steuri et al., 2023). In addition, the knowledge of Chamblandes-type graves in the German-speaking part of Switzerland was expanded. This was mainly achieved by a thorough reassessing of the necropolis of Lenzburg, Goffersberg, but also by the publication of the grave groups of Däniken, Studenweid (Steuri and Hafner, 2022) and Niederried, Ursisblam (Steuri et al., 2023). The evaluation of all major sites from the whole study area made it possible to clearly deliminate the geographical scope of the Chamblandes-type graves. The only point of discussion was regarding its western extent (potentially reaching central France), which was evaluated extensively in this work.

In addition, by doubling the total number of available radiocarbon dates (with comparatively very low uncertainty ranges), this research project has significantly advanced the understanding of the chronology of Neolithic cist graves in the Western Alps. After lengthy negotiations, it was possible to extract and analyse over 120 bone samples from archaeological sites located in today's Switzerland, France and Italy. For the first time, absolute dates are available for the previously lesser-known sites in the Aosta Valley, significantly expanding the understanding of the emergence of the Chamblandes-type graves (Steuri et al., 2023). In other instances, the data from this research were able to clarify the chronology of multiple sites, including the debunking of older, false radiocarbon dates and adjusting the age of sites, at times, by hundreds of years. The now-available radiocarbon data clearly indicate that sites were used over centuries, some even showing clear evolutions of funerary customs. In addition, for the first time, multiple dates are available for collective graves, proving that some stone cists were used over generations with multiple distinguishable usage phases.

The comparison of the full set of radiocarbon data suggests the intriguing hypothesis of an almost contemporaneous emergence of the use of stone cist burials on the southern shore of Lake Geneva and several inner Alpine valleys (Aosta, Tarentaise and Upper Rhône) around 4800 BCE. Some 300 years later, the Chamblandes-type graves spread in all directions to neighbouring regions. A sharp decline in radiocarbon dates

around 4000 BCE is evident, resulting in a ceasing of most burial activity within these cist graves around 3800 BCE.

Furthermore, although grave goods are famously scarce within Chamblandes-type graves, the (re)evaluation of the major sites revealed that objects interpreted as such were found within over 34% (n = 74) of the assessed graves. Combined with the newly available set of radiocarbon data, this allowed us to discuss the regionality and chronology of certain types of items. Further contributions of this study were the assessment of the likely origin of the raw material for certain types of objects and the highlighting of differences regarding the role of grave goods of Chamblandes-type sites in the inner Alps and the Swiss Plateau.

The various results of this study indicate that the communities who constructed and used Chamblandes-type graves shared common funerary practices. Considering the specific geographic features of the region, from high mountain ranges to large lakes and major rivers, this conclusion appears rather striking. Nevertheless, a more nuanced approach leads to the proposal of a model with two distinct funerary customs within the Chamblandes-type graves:

- The Villeneuve custom, prevalent in the inner Alpine valleys, consisting of sites with almost exclusive single-use graves in the form of stone cists and very few grave goods.
- The Genevray custom, consisting of necropolises with single- and multiple-use graves with differentiated treatments of the human remains in stone, as well as wooden cists or pits, with a higher frequency and variety of grave goods.

With that in mind, the limitations of this work have to be acknowledged and various aspects of the study of the Chamblandes-type graves need further research. First of all, one limitation is regarding the settlement process of the Western Alpine landscape at the beginning of the 5th millennium BCE, as this aspect does appear to be directly linked with the emergence of Chamblandes-type graves. In addition, it was suggested in this work that the choice of location for Chamblandes-type necropolises was also made under the aspects of visibility in the terrain, and the related control of trade routes. This indicates the need for further research related to landscape analysis, which could include the spatial relation of the known settlement locations to the burial sites, used road networks or the related location of resources (e.g. greenstone or flint).

Furthermore, one is tempted to correlate the end of the collective Chamblandes-type graves with the emergence of megalithic dolmen structures in the study region around 3300 BCE, especially, since the first megalithic elements in the Western Alps appear in the context of these stone cist graves. With few mentioned examples, the use of Chamblandes-type graves largely ended at the beginning of the 4th millennium BCE. This leaves at least 500 years with little to no knowledge about the burial practices and funerary structures of the local Neolithic communities. Causes for this research gap, such as a possible population decline in the inner Alpine valleys during this period, must be further investigated.

As a final outlook, one additional research gap will be addressed in the near future. While the radiocarbon data provided information on the absolute age of the human remains, scientific advances over the last decades enable us to learn more about the individual's life. In that sense,

A broad research project led by Dr. Sandra Lösch, BoNe: Bioarchaeology of Neolithic Inhumations in the Western Alpine Region (5000–3000 BCE). How are Changes in Burial Customs Linked with the Social Structure of Populations? (Swiss National Science Foundation project number 212378) will further analyse the human remains and collagen of the bone samples extracted for radiocarbon dating of this work (starting June 2024). Numerous new insights are expected from this research project: First and foremost, regarding the analysis of the ancient DNA from these individuals, this paleogenetic human data will allow for the study of the demographic history regarding population

origin, migration or kinship relations. Especially the last aspect will be very interesting in the context of the Chamblandes-type sites, to assess the genetic relationships between and within Neolithic populations of the Western Alpine region. In addition, stable isotope ratios of the extracted bone samples will provide information on nutrition, mobility, and arguably the social status of these Neolithic individuals. Furthermore, new osteological evaluations will allow more precise sex and age-at-death estimations, as well as insights into pathological changes or signs of violence for specific sites.

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Evolution of burial practices within Neolithic cist graves

In the 5th millennium BCE, the first farming societies in the Western Alps developed unique burial practices characterized by Chamblandes-type graves. These box-shaped graves, constructed from stone slabs or wooden planks, have intrigued archaeologists since the 19th century, particularly around Lake Geneva and the Upper Rhône Valley. This study delves into the origins, spread, and distinctive characteristics of these graves, especially their transalpine significance with an extensive focus on previously under-researched areas like the Italian Aosta Valley or the German-speaking part of Switzerland.

By significantly increasing the number of available radiocarbon dates, as well as comprehensively analyzing the grave goods and the treatment of human remains in the context of funerary practices, the study provides new insights into the chronology and regional variations of Chamblandes-type graves. This research reveals the contemporaneous emergence of the use of these graves in several Alpine valleys and the southern shore of Lake Geneva around 4800 BCE, as well as providing evidence for the process of their subsequent spread and sharp decline in use after 4000 BCE.

The findings reveal shared practices among these early farming communities, yet also

indicate distinct funerary customs between inner Alpine valleys and the Swiss Plateau. Highlighting that local prehistoric societies in the Western Alpine region reacted similarly to the death of an individual within the community, as expressed by grave architecture and the treatment of human remains. Demonstrating additionally, that the Alps should not be understood as barriers, but as a conduit for social exchange and interaction across valleys and mountain passes more than 6000 years ago. This nuanced understanding is essential for future research, setting the stage for studies on the social structure, mobility, and diet of these Neolithic populations through paleogenetic and isotopic analyses.

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